STATE OF CALIFORNIA

Information Technology Staff Recruitment and Retention

Protecting and Improving the Delivery of Services to California

FINAL REPORT
October 1998

You can obtain additional copies of this report by contacting:

Department of Personnel Administration
Classification and Compensation Division
(916) 324-9381

OR

This Report may also be available on the Department of Information Technology Web Site
http://www.doit.ca.gov

A special thank you to the California Information Technology Coordinating Council (ITCC) for making this report possible.

Table of CONTENTS

EXECUTIVE SUMMARY

"The State is at a great disadvantage when competing with other employers for qualified IT employees."

California state government faces a great challenge as it attempts to meet the growing service needs of its citizens. Modern information technology (IT) promises greatly improved services. In the future, our reliance on this technology to provide cost effective and enhanced government services will increase vastly. So much of what government is to the public today and what it will be in the future depends upon information technology. Our ability, to further use and develop technology, however, depends directly on the people we employ to develop and run our IT systems. The most effective means we have to protect and improve the delivery of services in California is to assure the application of qualified IT human resources to state IT systems.

This report discusses specific problems and opportunities associated with the State's ability to recruit and retain qualified IT staff. It examines the issues of IT recruitment and retention on an industry-wide basis, reviews expert recommendations, and analyzes current state practices. Finally, and most importantly, it offers recommendations for change that will positively impact the State's performance and thereby improve the delivery of citizen services, now, and into the future.

Information Technology Is Important For Citizen Services

Information technology is a key resource in providing citizen services. From providing social services to keeping dangerous felons off the streets, from collecting taxes to paying the State's bills, much of our current and future service delivery capability depends on an effective IT function.

With insufficient and underqualified IT staff, departments cannot provide the necessary support. State programs depend on IT operations to support them. In addition, it is becoming increasingly difficult to satisfy the demands of the legislature. Critical statewide policy decisions are sometimes affected by the inability of state IT operations to respond to mandated program changes, thereby inhibiting social reform and economic growth. Finally, the linkage between quality citizen services and effective IT is so strong, that an ineffective IT function should be considered a strategic risk and, potentially, a threat to public safety.

The Value of Qualified IT Employees

While the value of qualified IT employees is difficult to quantify, there is no question that skilled IT professionals are essential to the delivery of services to citizens. In order to fulfill their missions, state agencies must evaluate carefully their existing IT personnel resources against their current and projected IT skills needs, and act accordingly to fill those needs. Without necessary IT skills, agency programs will fail. As industry experts have noted

"Skills are what turn plans into actual creations, without them, nothing works."[1]

Currently, the State is Unable to Compete for Qualified IT Employees

The State is at a great disadvantage when competing with other employers for qualified IT employees. There is a shortage of IT professionals nationwide and predictions are that this shortage will continue well beyond the turn of the century. Currently, an estimated 346,000 computer programmer and system analyst positions are vacant in the U.S. for companies with more than 100 employees.[2] Current state practices, in many ways, hinder the State's ability to attract and retain IT professionals.

"Current state practices, in many ways, hinder the State's ability to attract and retain IT professionals."

For example, state IT salaries lag behind other employers' salaries by 25 to 30 percent without considering bonuses and stock options commonly offered in private sector employment. Although state employment offers flexible benefits, such as alternative work schedules and telecommuting, these benefits cannot compensate for salaries that are well below the market rate. State selection and classification practices make it difficult to fill positions quickly and develop critical technical skills. Moreover, state funding for professional development of IT employees is sorely lacking when compared to training investments of private sector employers. Finally, the State makes little effort to promote the image of the State's IT work environment to potential sources of qualified candidates.

The State IT Workforce is Being Diluted

Frequently, the pressure to fill vacant IT positions results in the hiring of "under-qualified" employees. The compromise is understandable: as the State becomes less competitive, standards are lowered. These employees require substantially more training to become effective. Unfortunately, once employed, state departments frequently do not make the investment in training many employees need so badly. It is from these diluted ranks of employees that IT managers are selected.

Why Not Outsource More IT Work?

Contracted assistance from the private sector plays, and will continue to play, an important role in providing IT services for the work of government. Contracting out work and outsourcing specific functions is simply another tool available to management. Contracting and outsourcing cannot be considered a total solution. The State must maintain sufficient expertise to manage the contracted function. In addition, the State has an interest in assuring proper IT integration with programs and in getting the best value for the taxpayer. To accomplish these objectives, the State must maintain a critical mass of technical competence. In order to do so, the State must improve its recruitment and retention practices.

The Situation Can Be Improved Significantly With Change

Based on its research, review and analysis of recruitment and retention issues confronting the State of California, the Task Force developed a series of recommendations for change. The following recommendations contain the Task Force's best thinking and judgment. Further, to assist in the implementation of recommendations, the agency capable of accomplishing the recommended changes has been identified. In addition, in most cases, implementation will require multi-agency collaboration. Finally, in the context of current and ongoing efforts to protect and improve the delivery of services in California, the following recommendations represent and encourage the continued vision to reform the State's IT recruitment and retention practices.

Recommendations for Change to Compensation of IT Personnel

Problem Statement

The State's compensation program demonstrates a substantial salary lag compared to private and public sector employers in the State of California and is not keeping pace with the dynamic marketplace for IT professionals.

Recommendations

1. The Department of Personnel Administration (DPA), working in conjunction with the Department of Information Technology (DOIT), should bring salaries in line with IT market rates.
2. The DPA should review and authorize geographic pay differentials, if warranted.
3. The DPA should establish bonus programs that give departments recruitment and retention flexibility.
4. The DPA should review existing recognition programs and implement changes to broaden their use by all state agencies.
5. The DPA should review the applicability of the recent federal overtime exemption from the Fair Labor Standards Act's (FLSA) for IT employees.
6. The DPA should review and update benefit programs to enhance IT recruitment and retention.

Recommendations for Change to the Selection Process

Problem Statement

The State's examination process is decentralized, slow and highly dependent on intra-departmental coordination. It is not able to respond to rapidly changing business needs.

Recommendations

1. The State Personnel Board (SPB) should centrally administer open, statewide, continuous filing and testing IT examinations on the Internet and modify the examination process to:
    - limit the number of eligible ranks;
    - give departments on-line access to eligible lists by skill set; and
    - provide for use of on-the-spot hiring techniques for recruiting IT professionals.
2. The DOF should provide the SPB with funding for the development and administration of central, statewide, open Internet testing for IT classifications.
3. The SPB, in concert with user departments, should improve the Student Assistant / Graduate Student Assistant transition process.
4. The SPB and the DPA should develop training on "how to hire" for IT managers.
5. The SPB should explore utilizing proactive recruitment strategies providing centralized recruiting services on a reimbursable basis for all state departments.

"The State's IT classification structure does not adequately describe the current work and fails to accommodate the rapidly changing needs of the Information Technology industry."

Recommendations for Change to the IT Personnel Classification System

Problem Statement

The State's IT classification structure does not adequately describe the current work and fails to accommodate the rapidly changing needs of the Information Technology industry, consequently:

- The minimum qualifications do not provide for the selection of candidates with emerging competencies essential for business success.
- The structure limits employees' ability to develop competencies in emerging technologies and apply them to related work to improve their opportunities for career advancement.
- The structure restricts the departments ability to assign employees work in emerging technologies.

Recommendations

1. The DPA and SPB, working with the DOIT, should reduce the number of IT classifications.
2. The DPA and SPB, working with the DOIT, should redefine classifications to permit wider flexibility in the assignment of work and improved opportunity for employee career advancement.
3. The DPA should eliminate the current IT allocation guidelines and develop a tool for allocating positions based on the organization's business needs.
4. The DPA should establish a "policy sounding board" on allocation guidelines to periodically review them for equity across departments.

5. The DPA and SPB, working with the DOIT, should create alternative minimum qualifications based on skill competencies and knowledge rather than current time-in-grade and educational level requirements.
6. The DPA should create an IT classification structure that has inherent flexibility to adjust to the IT industry over time.
7. The DPA should provide for the career and salary advancement of the "technical expert" commensurate with managerial levels.
8. The DPA should create an IT classification structure that provides for employee movement from entry-level to journey level based on acquisition and demonstration of skills rather than by examination.

Recommendations for Change to IT Professional Development Practices

Problem Statement

There has been insufficient action taken by the State of California in recognition of the importance of on-going professional development to the recruitment and retention of a cost effective, highly qualified and productive IT workforce. Insufficient funding and maintenance of IT skills results in the inability to develop, maintain, and deliver quality networks and applications on time and within budget in a rapidly changing environment.

Recommendations

1. The DPA, working with the DOIT, should establish a statewide policy requiring that departments develop annual training plans that support their strategic objectives. The training plan should include assessment of current skills against required skills necessary to accomplish objectives.
2. The DPA, working with the DOIT, and the Department of Finance (DOF) should establish a standard, based upon industry standards, for annual training dollars or number of training days per IT employee. This standard should be evaluated and adjusted annually, as necessary.
3. The DPA, jointly with the DOIT and the DOF, should develop a policy for issuance by the Governor's Office, that departments budget an amount each year solely for the purpose of funding the IT training expenditure standard for annual training dollars / days.
4. The DPA, working with the DOIT and the DOF, should sponsor legislation to allocate training dollars for 2 years to compensate for the training shortfall that has occurred in the past several years.
5. The DPA, working with the DOIT and appropriate agencies, should establish agreements with the California State Universities and / or UC Extension programs to offer a cost-effective consistent IT curriculum of industry-recognized IT certifications supporting state core technologies. These agreements should be established in at least four major metropolitan areas; San Francisco, Sacramento, Los Angeles, and San Diego.
6. The DPA, working with the DOIT and the DOF, should institute a reimbursement program for employees that acquire professional certification and offer skills acquisition bonuses for completed certification.

7. The DPA should establish a statewide policy aimed at recapturing a portion of certification training costs if an employee separates prior to a designated time frame.
8. The DPA should work with the appropriate state agencies to negotiate and manage the subscription to a centralized, computer-based training (CBT) program for the core technologies employed by departments. The program should be available to approved state employee "students" via the Internet and must include student utilization and progression monitoring.
9. The DPA should establish and monitor conformance with statewide policy that IT managers attend continuing education to include, but not be limited to customer service, administrative management, people management, project management and management level technical training.

Recommended Changes To Market the State of California as an IT Employer

Problem Statement

The State does a poor job of marketing information technology job opportunities. The current image of state employment hinders our ability to attract and retain qualified information technology professionals.

Recommendations

1. The DOIT, working with the SPB, should be charged with the overall responsibility for state IT marketing activities, including improving the public image of state IT efforts through visibility and positive publicity.
2. The SPB should be funded and charged with responsibility for developing marketing materials to assist state departments in recruiting IT employees. This should include:
    - Attractive marketing materials to reshape the image of state IT employment in a more positive light.
    - Simple brochures to explain the civil service system, the job classifications available, compensation and other benefits, career advancement opportunities and the advantages of having a state IT job.
    - Consideration should be given to other communication mechanisms such as radio or television ads, video that can be delivered via the Internet, newspaper and trade journal advertising, etc.
3. The SPB should create a special section on their Internet site designed exclusively to attract and assist IT candidates in obtaining state employment.
4. The SPB should create a single, searchable index on their Internet site exclusively for the posting of IT job opportunities open to the public and provide a simple way for all state departments to post job vacancies through this service.

PREFACE

Introduction

"The Task Force has worked diligently to conduct its review and to develop strategies that ensure that the State of California has an adequate number of highly qualified technology professionals…, to support state operations."

In California, as well as nationwide, rapid technological growth has led to increasing demands for skilled technology workers. With increased demands for highly qualified information technology (IT) professionals, high turnover rates, and the growing number of IT job vacancies, government and private enterprise face significant challenges in recruiting and retaining information technology professionals. Recognizing the need to confront these challenges, the Information Technology Coordinating Council (ITCC) initiated the establishment of the Task Force on Information Technology Staff Recruitment and Retention. The Task Force executive sponsors include the Department of Information Technology (DOIT), the Department of Personnel Administration (DPA), and the State Personnel Board (SPB). Comprised of twelve members representing eleven different state agencies, the Task Force includes state IT managers as well as Human Resources staff. A full listing of Task Force members is included in *Appendix A: Task Force Sponsors and Members*.

Charged with the mission of identifying, analyzing and researching recruitment and retention issues and developing appropriate recommendations, the Task Force began its work in July 1998, with recommendations to be provided in September 1998. In this limited time frame, the Task Force has worked diligently to conduct its review and to develop strategies that ensure that the State of California has an adequate number of highly qualified technology professionals, both staff and management, available to support state operations. The fundamental objective underlying Task Force research, analysis and discussions, and hence the title of this report, is "Protecting and Improving the Delivery of Services to California."

Background

Environmental Context

In the last decade, rapid technological advances have permeated almost every aspect of public and private enterprise throughout the world. Such changes have impacted how business is conducted and the way people live their lives. Moreover, technological advances account in large part for the economic growth in recent years. The United States Commerce Department estimates that as much as 50 percent of the recent growth in the U.S. economy can be attributed to technological advancements and associated costs savings. The dramatic changes in the information technology field and strong economic growth directly correspond to the increased competition among private and public enterprise for qualified IT professionals.

A recent study conducted by industry experts revealed that:

- 1 in every 10 information technology jobs in the United States is unfilled.
- An estimated 346,000 computer programmer and system analyst jobs are vacant in U.S. companies with more than 100 employees.
- The shortage of IT workers has spread to many non-technology firms, such as banks, hospitals and retailers.
- Current projections show no let up in the demand. According to the U.S. Labor Department, from now to 2005, an average of 95,000 new computer scientists, system analysts and programmers will be needed every year.[3]

"1 in every 10 information technology jobs in the United States is unfilled."

It is important to note that there are essentially two schools of thought regarding the demand for IT professionals; one believes there is a shortage, the other does not. Those that hold there is no shortage believe that the perceived crisis is a result of increased focus on Year 2000 issues and/or an effort to increase the number of lower cost foreign technology workers. In light of these differing views, the Task Force developed its detailed survey (Task Force Survey) to obtain an accurate assessment of the recruitment and retention issues for the State of California. As discussed below and throughout the report, the Task Force discovered that in California, the shortage of qualified IT professionals is very real.

Across the country, private and public entities seeking relief from the shortage must find ways to recruit and retain qualified technology workers. More and more organizations, in both the private and public sector, are establishing task forces to study and address recruitment and retention issues. IT staff turnover rates, which historically have averaged between 6 percent and 10 percent, now average between 12 percent and 20 percent. Approximately 10 to 25 percent of internal positions are open at any time, and the average time needed to fill these jobs is as much as nine months, depending on region and skills. Further, the associated costs of refilling a vacant position is roughly equivalent to one person's salary in hard costs, alone, including recruiting fees, management time, higher salaries for new hires and lost productivity.[4]

In order to attract and maintain qualified IT personnel, organizations must take into account the characteristics of today's workforce as defined by industry experts:

- Employees are more likely to trade security for money and time.
- Employees are more willing to relocate.
- Baby Boomers want flexible hours and part-time work.
- Generation Xers want good pay and flexibility.
- The nature of IT project work allows people to work flexible hours.
- Employees are much more concerned about compensation due to the higher costs of living, retirement costs and greater debt for college graduates. [5]

Studies, surveys and reports of trade journals, professional magazines, and industry analysts are consistent. IT professionals want good, but not necessarily fat paychecks. They also want employers to care about quality of life issues. They want enjoyable work environments, good bosses, and challenging opportunities.

In response, private and public enterprises are:

- Increasing salaries and ensuring that salaries remain competitive;
- Instituting flexible benefit programs, with increased vacation time, flexible work schedules, telecommuting, subsidized child care, and better retirement options;
- Utilizing bonus systems with such bonuses as signing bonuses, referral bonuses, project milestone and retention bonuses;
- Providing and funding training, and other professional development, opportunities;
- Restructuring career ladders to provide IT employees with alternative career paths; and
- Implementing employee recognition programs that reward employees through various means such as gift certificates, dinners, and casual dress days.

"Since 1995, salary increases among many public agencies with which the State must compete for qualified staff have ranged up to 40 percent."

It is within this context, that the State of California must confront its own recruitment and retention challenges.

Overview of Current State Environment

The following summary of data collected by the Task Force provides a current snapshot of factors affecting recruitment and retention efforts in California state government.

Turnover of IT Personnel

- 648 more IT employees left state service over a four-year period (July 1994 - May 1998) than were hired.
- The inability to adequately compete with the other public agencies and the private sector for new employees has caused excessive movement of IT staff between departments. This excessive movement, a total of 17 percent over the last four years, has resulted in costly turnover and disruption of state services.
- The rate of attrition for state IT positions has increased each year from July 1994 (2.6%) to June 1998 (4.1%), a 57 percent increase.[6]

Current Salaries for IT Employees

- State IT "represented" employees have not received a salary increase since January 1, 1995 even though the Consumer Price Index has increased more than 8.6 percent during that time.
- Since 1995, salary increases among many public agencies with which the State must compete for qualified staff have ranged up to 40 percent.
- State salaries lag the private sector in Sacramento by an average 24 percent.[7]
- Private sector IT salaries vary geographically and may account for as much as an additional 7 percent lag in major metropolitan areas.[8]

Collective Bargaining

- Unlike most private sector employers, the State of California must work within its collective bargaining framework to make changes to compensation or job classifications.

Hiring Process

- The State of California does not effectively utilize advertisement of IT positions.
- Based on the Task Force Survey results, an average 6 months is required to issue an exam bulletin, test applicants, rank candidates, and fill an IT position.

"The current classification system for IT personnel was developed during the 1970's and few changes have been made to the system since then."

Classification of IT Employees

- The current classification system for IT personnel was developed during the 1970's and few changes have been made to the system since then.
- The State of California currently employs approximately 6,600 IT professionals placed into a classification structure composed of 61 classes. Over 37 percent of the total number of state IT employees fall into two classes: Associate Information Systems Analyst; and Associate Programmer Analyst.

Current Spending for Training of IT Personnel

- The State of California's annual training investment per IT employee is approximately $1,300 as opposed to the industry average of $3,000, or the $5,000 spent by well-trained organizations, or the $6,200 spent by leading-edge enterprises.
- Expressed as a percentage of payroll, the current training expenditure for California IT employees is 2.9 percent compared to the minimum figure of 5 percent recommended by industry experts.

Image of the California State IT Work Environment

- The current image of state employment is often negative. Recent IT project failures, reported by the media, have had a negative impact on public perception of the state IT workforce and environment.
- Qualified applicants are typically unaware of available state jobs and are often perplexed and deterred by the State's hiring process.

These facts alone present a compelling case for change. Many agencies that have recognized this need are studying these issues and implementing much needed change. The Task Force has identified major problems and recommends changes based on the findings presented in this report.

Methodology

Organizational Framework and Task Force Subcommittees

"..the Task Force examined approaches of other states to recruitment and retention of IT personnel."

To conduct its analysis of IT recruitment and retention issues, the Task Force defined major categories for review and assigned its members accordingly to separate subcommittees to study each of these areas. Each Task Force subcommittee met on a regular basis to narrow their research and to develop recommendations within their assigned area of responsibility. The Task Force met weekly to discuss findings and proposed recommendations from each subcommittee. Using this organizational framework, the Task Force defined overall goals and objectives for IT recruitment and retention. The major categories and objectives include:

- **Compensation:** Develop a competitive compensation package;
- **Classification:** Create a more flexible classification plan;
- **Selection:** Streamline the selection process;
- **Professional Development:** Increase opportunities for professional development; and
- **Marketing:** Develop and implement a marketing plan to attract highly qualified candidates.

Research

Indeed, these major categories of IT recruitment and retention issues confront public and private enterprises nationwide. Using information from industry experts such as the Gartner Group and RHI Consulting, as well as IT publications provided by the California Research Bureau and materials from journals, magazines, and the world-wide-web, the Task Force conducted its research and developed a framework for its findings and recommendations.

The Gartner Group, Inc., founded in 1979, is the world's leading, independent provider of research and analysis of the IT industry. The organization has studied extensively the topic of recruitment and retention and has assisted numerous private and public sector clients in developing recruitment and retention programs. Gartner Group professionals are often featured speakers at trade conventions and their research and recommendations are cited in numerous trade journals and computer magazines. RHI Consulting is one of the nation's leading staffing services, placing IT Professionals on a project basis as needed for technical support and development.

In addition to these resources, the Task Force examined approaches of other states to recruitment and retention of IT personnel. Recruitment and retention information from the States of Illinois, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New York, North Carolina, Ohio, Pennsylvania, Texas, Virginia, Washington, West Virginia, and Wisconsin, many of which have

taken serious steps to bolster retention and combat the attrition of state IT employees, proved useful.

Survey Development and Results

Their respective experience with state agency IT recruitment and retention enabled Task Force members to conduct a first-hand review of existing state policies, procedures, and practices. In addition, pilot projects related to technological concerns in California have been ongoing, providing the opportunity for the Task Force to witness the progression of change. Drawing upon their collective experience, Task Force members developed a survey to solicit recruitment and retention data from California state agencies. In order to determine the magnitude or degree of the problems facing the State of California, the survey was distributed to 37 state agencies. Both large and small state agencies were targeted to gain an accurate depiction of current retention and recruitment practices. Of those state agencies receiving surveys, 25 completed and returned them in time to be included in this report. Detailed survey results can be found in *Appendix F: Task Force Survey Results*.

Final Report

Computer Resources Group (CRG), an IT staffing and consulting services company with over 26 years experience recruiting and placing IT professionals, was contracted to assist the Task Force in its mission. CRG consultants participated in the collection, review and organization of research materials, preparation of the Task Force Survey, compilation of survey results, and assisted the Task Force in development of the final report. The final report presents the findings and recommendations of the Task Force. Consistent with the methodology employed by the Task Force, the report contains sections on each of the five major areas of study. Each section begins with a discussion of research findings, examines the current state environment, sets forth a succinct problem statement, and concludes with recommendations.

STATE IT COMPENSATION

Research Findings

Research findings of the Task Force Subcommittee on Compensation provided a strong case for change to the State's current compensation system in order to meet the stated objective of recruitment and retention of qualified IT professionals. As indicated by the research:

"The State's compensation program demonstrates a substantial salary lag compared to private and public sector employers in the State of California and is not keeping pace with the dynamic marketplace for IT professionals."

- Competitive salaries and flexible benefit programs (i.e., those that address quality of life issues such as flexible work schedules and telecommuting) enable private and public enterprises to attract and keep well-qualified IT employees.
- Regular pay increases are important to limit costly employee turnover.
- Bonus systems and other recognition programs are valuable tools for recruiting, rewarding and retaining IT professionals.
- Although states subject to collective bargaining systems face particular challenges when revising compensation, several states have used collective bargaining to make much needed changes.

Competitive Compensation Packages Are Essential to Recruitment and Retention

Numerous articles in trade journals and technical magazines, as well as presentations at trade conventions, indicate that both private and public sector organizations find they must offer competitive salaries and flexible benefit programs in order to attract and keep qualified IT professionals.

Competitive Salaries

Industry analysts have found that small salary increases will not necessarily lure IT professionals from their current jobs. However, salary increases of 20 percent or more are likely to entice employees. According to the Gartner Group, in order to retain IT employees, organizations should pay within 15 percent of market rates.[9] Organizations that do not, are at risk for employee turnover**.** Gartner Group estimates that nearly 70 percent of their client organizations are re-examining IT salary structures and that roughly 50 percent have begun adjusting salaries to within 10 percent of market rates.

Flexible Benefit Programs

Money, alone, cannot buy happiness for the IT professional. As the Gartner Group observed, "Although salary is a seductive siren call for IT professionals, it is seldom the sole reason or even the chief reason that IT professionals leave. Quality of life, flexibility, professional development and environment outweigh salary."[10] In a recent salary and job satisfaction survey of more than 500 IT professionals (technical staff members, not managers) conducted by Computerworld magazine, the recurring response was "a good paycheck" and "balance work with other needs." [11]

More and more organizations are offering flexible benefit programs that address quality of life issues, such as increased vacation time, flexible work schedules, telecommuting, tuition reimbursement, and employer subsidized child-care.[12] Many employers find that such benefit programs create a corporate culture of respect for employees. Although it may seem intangible, this sense of respect, when combined with competitive salaries, directly contributes to retention success.

"..the cost of turnover can be 100 to 250 percent of an employee's salary."

It is important to note that flexible benefit programs are not an effective retention tool if the organization's salaries are not competitive with market rates. Employees evaluate the trade-offs of higher salaries and quality of life issues. By offering flexible benefit programs, employers do not necessarily have to match the highest salaries, but should offer salaries within range of the competition. As the Gartner Group points out, "The importance of benefits varies: Do not assume that casual dress will compensate for dissatisfaction with below-market salary traditions."[13]

Pay Increases as A Means to Decrease Turnover and Associated Expenses

Regular pay increases help keep salaries competitive and decreases employee turnover. As the industry experts have noted, "without pay increases, salaries do not remain competitive. The corresponding result is that employees leave, citing increased pay as the reason, and in doing so take valuable enterprise knowledge with them."[14] State governments, in particular, have difficulty implementing regular pay increases.

Often faced with strict budget constraints, states are not as able as their private and public sector counterparts to increase salaries, further widening the gap between state government and private industry. In West Virginia, for example, the State had not been able to increase pay since 1994 until it developed a special pay differential awarded to IT employees based on criticality of job, in conjunction with performance evaluation.[15]

State governments, however, must find a way to close the gap, if they are to manage employee turnover. Gartner Group forecasts that by the year 2002, "… 45 percent of enterprises will restructure their IT human resource program substantially. . . Within those enterprises, the base salary for 75 percent of IT work roles will be 25 percent to 30 percent higher than today's rates; 20 percent of IT professional positions will regularly remain vacant for longer than six months; and contractors will fill, on average, 15 percent of IT positions."[16]

Moreover, according to the Gartner Group, the cost of turnover can be 100 to 250 percent of an employee's salary. Expenses associated with turnover include hard costs such as advertising, interviewing, interim worker fees, higher salaries for new employees, relocation fees and sign-on bonuses; and soft costs such as interview time, loss of know-how, employee morale, productivity loss and loss of momentum.[17] In short, "sacrificing an employee to corporate stubbornness about salaries or bonuses is a costly decision."[18]

Other State Governments Are Making Compensation Changes

Information collected by the Task Force, regarding other state compensation issues, clearly indicates that the State of California is not dealing with a unique situation.

"Both private and public enterprises are utilizing a variety of bonus-based incentives to recruit and retain staff."

Some states have taken action to address the salary disparities. In Texas, for example, since December 1, 1992, the consumer price index has increased over 10 percent, and the mean salary of a senior computer systems analyst in Austin, Texas increased more than 16 percent.[19] In response to such changes, "The [Texas] legislature boosted the pay schedules of all IS employees [with programmer and system analyst pay]..well above the national average."[20] In addition, Missouri's central compensation agency reports that, while its general marketplace progress plan targets 95 percent of market pay for all classes with a one year delay, its IT proposal will target 100 percent of market pay with no delay.[21]

Monitoring the IT Marketplace

The Task Force found that a key element for addressing IT retention and recruitment problems is for the State to keep its 'fingers on the pulse' of the State's IT workforce. Well-organized collection of exit interview data and frequent surveys of the marketplace, as recommended by Gartner Group, are key to this activity.[22] North Carolina is testing an Internet application to collect exit interview information. West Virginia has conducted three IT salary surveys in the last year, and North Carolina is considering doing this every six months.[23]

Bonus Systems and other Recognition Programs Contribute to Successful Recruitment and Retention

Bonus systems and employee recognition programs are becoming commonplace in organizations seeking to recruit and retain qualified IT employees.[24] Gartner Group estimates, that in the past 12 months, roughly 60 percent of their clients have implemented long and short-term cash incentives as a means of retaining key IT professionals.[25] Bonuses can serve as a means of bringing employee compensation within range of market salaries without having to build it into the salary base, while recognition programs serve to make employees feel valued.

Both private and public enterprises are utilizing a variety of bonus-based incentives to recruit and retain staff. For recruitment purposes, many organizations offer signing bonuses for high-demand skills and referral bonuses for employees who successfully attract new IT personnel. Skills-acquisition bonuses are also used to encourage existing employees to acquire advanced skills. Another type of bonus, the project or milestone bonus, is paid to employees for meeting certain project goals.[26]

In addition, recognition programs offer incentives for employees to remain with a company. "Annual company excellence awards, special rotations, flexible work hours, sabbaticals for long-term employment, extended vacation periods, gift

certificates to local stores and restaurants, semiannual department dinners and awards, opportunities for casual dress, celebrations for milestones met," are all examples of recognition programs. These programs "help encourage solutions, engage individuals, build team value systems, celebrate success, promote a fun workplace, and help minimize potential turnover and related costs."[27]

Ways in Which Collective Bargaining Can Be Used to Make Compensation Changes

"State IT represented employees have not received any salary increase since January 1, 1995 even though the Consumer Price Index has increased more than 8.6 percent during that time."

Collective bargaining systems can impose significant restraints on the ability of state governments to make compensation changes. However, a growing number of states have found ways to implement change within the collective bargaining framework:

- Nebraska has implemented salary adjustments and bonus systems.[28]
- Ohio recently initiated a workforce development fund to provide additional training and educational opportunities for IT employees.[29]
- Michigan uses collective bargaining as its pay-setting mechanism for IT technicians, while it uses a completely different pay-setting mechanism for IT professionals, i.e., comparative surveys of prevailing pay with recommendations to a governing body.[30]
- Massachusetts, under its Technical Pay Law (TPL), can designate certain professional-level IT positions to be exempt from the pay levels in the state's collective bargaining contracts and to be paid instead from a salary schedule. The salary schedule is more reflective of the current labor market for IT jobs and contains provisions to return positions to the collective bargaining title and salary rate. Additionally, TPL staffs also are eligible for one of two bonus plans.[31]

Current State Environment

The Task Force's review of the current state situation with regard to compensation revealed the following:

- In the last several years, there has been an increasing net loss of state IT personnel.[32]
- Almost all state IT employees are at the maximum salary range for their classification.
- State IT "represented" employees have not received any salary increase since January 1, 1995 even though the Consumer Price Index has increased more than 8.6 percent during that time.
- The State faces increasing competition, not only from the private sector, but from other public agencies that compete heavily with the State for IT personnel in Sacramento, the San Francisco Bay Area and Los Angeles. Recent data indicates that during the period from 1995 to 1998, these public agencies have increased salary ranges dramatically, in some cases up to almost 40 percent.
- Geographic pay differentials need to be considered when evaluating compensation due to differences found between cities such as Los Angeles, San Francisco, and Sacramento.

- State IT salaries lag substantially behind those in the private sector.

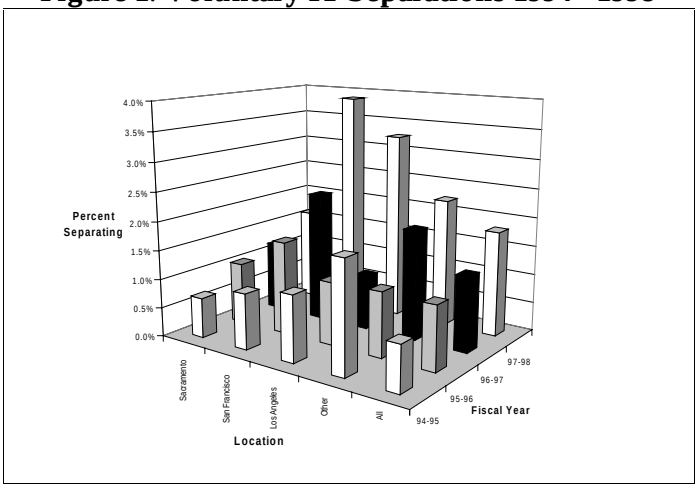
While this is by no means a comprehensive list of current compensation issues affecting the State's ability to recruit and retain IT professionals, it focuses on the most pressing concerns that can be addressed readily. It is also important to note that the State's collective bargaining system presents unique challenges in developing methods for compensation revision.

Employee Turnover -- Net Loss of State IT Personnel

In July 1998, the SPB compiled summary statistics which show that 997 voluntary separations of IT personnel occurred in the four-year period from July 1994 through June 1998. During that time, there was a net loss of 648 IT employees even with data adjusted for the effects of new employees hired and involuntary separations. [33]

In another study, using data provided by the State Controller's Office, the rate of attrition in IT classes was reviewed for the same 4-year period. This data was also compared for year-to-year trends in voluntary separations for each year. Shown is Figure 1: Voluntary IT Separations 1994 – 1998, voluntary IT attrition increased in step-like fashion with each succeeding year, *without exception*, for Sacramento, San Francisco, and statewide IT positions. Details can be found in *Appendix C: Civil Service Attrition Rates.*

Figure 1: Voluntary IT Separations 1994 - 1998



Source: *State Controllers Office, July 1994 – June 1998*

Survey Results -- Factors Most impacting Recruitment and Retention of State IT Personnel

In the Task Force Survey, IT managers were asked to select those skills that are most critical to their business need from a pre-defined list of 93 skill sets. IT managers were then asked to select, from a list of reasons, the predominant factor impacting recruitment of the critical skills. The response, "cannot offer competitive pay", was cited most often as the reason for continued vacancies in IT positions for high-demand skills such as Oracle, Cobol, Visual Basic, Project Managment, Windows 95/NT operating systems, ADABAS, HTML, and TCP/IP.

In addition to identifying factors impacting recruitment of necessary skills, the survey directed IT managers to characterize their critical skill sets in terms of the degree of difficulty in retaining each specific skill. They were then asked to select, from a list of reasons, the predominant factor impacting retention of the particular skill. Managers cited *increase in pay* most often as the perceived reason that employees with a particular skill leave.

"IT salaries, reported nationwide in various salary surveys, historically have grown 4 to 9 percent annually."

The survey also instructed IT managers to use a scale of 1 to 6 (1 being the most important) to rank the categories that they believed would help recruitment and retention efforts. Of the sixteen categories, the compensation categories of Equitable Base Pay and Flexible Compensation (e.g., Bonus and Benefits) were ranked #1 and #2, respectively for recruitment and #1 and #4 for retention.

Compelling Case for Change to Current State Compensation

IT salaries, reported nationwide in various salary surveys, historically have grown 4 to 9 percent annually.[34] IT salaries are increasing faster than the rest of the economy, and are a significant factor in recruiting applicants.

In order to meet the primary objective of recruiting and retaining qualified IT professionals, the State must be receptive to change. The Task Force Survey results indicate that agencies need to offer competitive compensation. The fact that state IT salaries are significantly less than those offered by private enterprise, and the absence of any salary increases for state IT "represented" employees since January 1, 1995, presents a compelling case for change to the current state compensation system.

State IT employees received a general pay increase of 3 percent in 1995. Since that time, the cost of living in California has continued to increase an average of approximately 2.4 percent each year for a total increase of more than 7.3 percent ending December 31, 1997.[35]

Public Sector

State IT salaries currently lag behind other public sector salaries. Figure 2: DPA Public Sector IT Salary Comparison, illustrates a comparison of maximum salaries for a journey level programmer in 14 public agencies throughout California.[36] This illustration shows how the State's maximum salary, once in the top five (1995), has fallen to the bottom of the list over the past three years (1998).

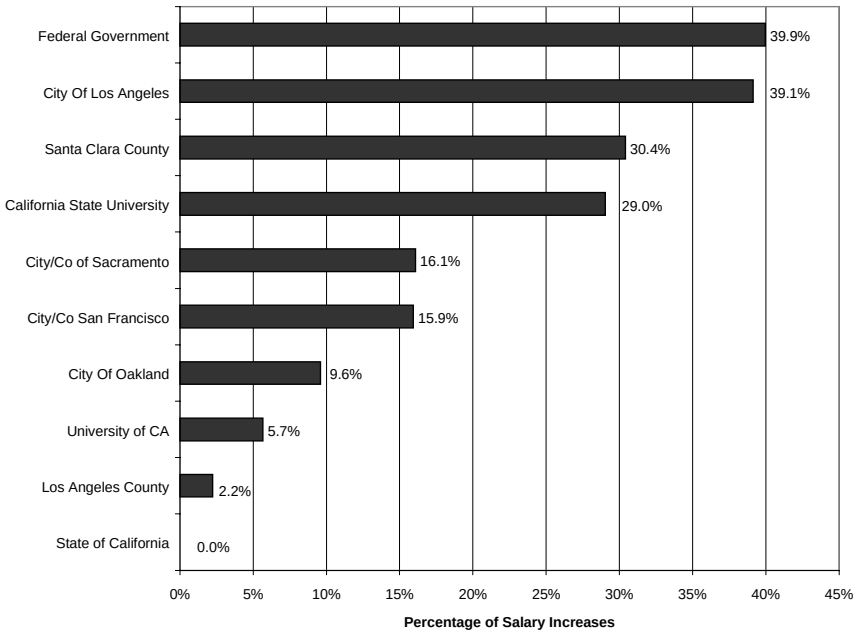
Figure 2: DPA Public Sector IT Salary Comparison

ENTITY	Jan-95 Maximum Salary	ENTITY	Jan-98 Maximum Salary
City Of Oakland	$4,830	Federal Government	$5,847
CSU	$4,506	CSU	$5,814
Contra Costa County	$4,467	City Of Oakland	$5,293
University of CA	$4,417	City of Riverside	$4,882
State of California	**$4,346**	City Of Los Angeles	$4,839
Federal Government	$4,178	Sacramento County	$4,790
Sacramento County	$4,143	City/Co San Francisco	$4,788
City/Co San Francisco	$4,130	City of Sacramento	$4,709
City of Sacramento	$4,041	University of CA	$4,667
Los Angeles County	$3,997	Contra Costa County	$4,503
City of Riverside	$3,823	Riverside County	$4,501
City Of Los Angeles	$3,478	Santa Clara County	$4,418
Riverside County	$3,391	**State of California**	**$4,346**
Santa Clara County	$3,388	Los Angeles County	$4,086

Data is from State of California Salary Surveys 95-96 and 97-98 based on one classification, journey-level programmer.

The same data is represented in Figure 3: Comparative IT Salary Increases By Public Agency. This graph illustrates that state compensation has not increased, while the average increase for the other public agencies was 20 percent.

Figure 3: Comparative IT Salary Increases By Public Agency - 1995 – 1998



Source: *DPA Comparative Salary Data - January 1995 and January 1998, journey level Programmer.*

Private Sector

In determining the private sector comparative salary data in Figure 3: Comparative IT Salary Increases By Public Agency, the DPA extracted survey information from William M. Mercer, Inc., Compdata, Employers Research Group, Warren Surveys, Allied For Health, and the Federal Bureau of Labor Statistics area occupational compensation surveys. The DPA determined that an actual salary

(not maximum) for a journey level programmer in the private sector in January 1998 was approximately $5,079. This represents a 17 percent pay differential between the state and the private sector.

The Impact of Private Sector Salaries and Geographic Pay Differentials

In addition to the competition from other public agencies attempting to recruit IT personnel in Sacramento, the San Francisco and Los Angeles areas, the State must find ways to compete with private sector enterprises that offer significantly greater salaries to IT employees. Summary data collected at an informational hearing conducted by the SPB on July 1, 1998 showed that California state salaries significantly lag behind current private sector rates in California and other West Coast states.[37]

Moreover, state agencies with offices in the San Francisco Bay Area reported greater difficulty recruiting and retaining IT professionals than departments in Sacramento. This is primarily due to larger pay differentials between state salaries and those of San Francisco area employers. In particular, the State has difficulty competing with salaries offered by high-tech companies in and around the Silicon Valley. The Economic Research Institute's (ERI) 1998 Salary Survey, *Appendix B: ERI Salary Sampling*, indicates that, on average, the State is 24 percent behind private sector IT salaries in Sacramento and San Francisco lags an additional 7 percent behind the Sacramento private sector for a total lag of 31 percent.

The Impact of Collective Bargaining on IT Recruitment and Retention

Successful recruitment and retention of IT professionals will depend, in large part, on the changes made to the current compensation system. When determining how to address the much needed IT compensation changes, the State must take into account the unique challenges presented by the State's collective bargaining system. While private enterprises often have the financial stability and flexibility to offer higher salaries, bonuses, regular substantial salary increases and profit sharing, the State, operating under the collective bargaining system, does not have the same flexibility.

The State of California has made limited progress in fostering IT retention within the State's collective bargaining environment. Recent collective bargaining agreements of the FTB provide a good model for review. Under the provisions of the current Unit 1 collective bargaining agreement, the FTB established a special employee recognition program. Specifically, this program provides cash and non-cash awards, not exceeding $50, to employees. Non-cash awards can be desk sets, watches, clocks, certificates, plaques etc. Food items can be purchased for a 'recognition event.' However, the program only covers 'represented' employees and does not allow for recognition of supervisors.

Accordingly, the State, in cooperation with California State Employee Association (CSEA), should review carefully the nuances and parameters of the current collective bargaining system to determine if and how IT compensation changes can be made through collective bargaining.

Problem Statement

The State's compensation program demonstrates a substantial salary lag compared to private and public sector employers in the State of California and is not keeping pace with the dynamic marketplace for IT professionals.

Recommendations

1. The DPA, working in conjunction with DOIT, should bring salaries in line with IT market rates.

State IT salaries should be adjusted to within 15 percent of the California labor market, as defined by the DPA. Such an increase is reasonable and allows for offsetting adjustments in other areas of compensation. In order to maintain salaries at a competitive level, they should be reviewed on a periodic basis.

Since California IT salaries are approximately 25 percent behind other public sector salaries in California, the implementation of this recommendation would require an immediate 10 percent salary increase. The approximate estimated cost of this increase for the 6,600 state IT employees, including benefits, would be about $41 million.[38]

2. The DPA should review and authorize geographic pay differentials, if warranted.

The DPA should review geographic salary data to determine if geographic pay differentials are necessary for departments experiencing recruitment difficulties outside the Sacramento area. If it is determined that such differentials are warranted, departments should be provided the authority to hire using geographic pay differentials.

Any salary improvement must provide particular relief for salaries in San Francisco and Los Angeles. State departments in San Francisco have reported problems hiring programmers and other IT professionals due to the severe salary competition from the private sector.

Departments in these major metropolitan areas need considerable salary flexibility in recruitment. They should be delegated the authority to offer any step in the salary range of the classification for which they are recruiting. This should be in addition to any hiring bonuses that may be authorized.

3. The DPA should establish bonus programs.

The DPA should establish bonus programs that give departments recruitment and retention flexibility. These bonus programs will help the State increase its competitive position with the other public and private agencies. Bonus programs to consider are:

- **Signing Bonus** – A lump-sum amount designed to recruit high-demand skills.
- **Referral Bonus** – A lump-sum amount paid to employees who provide referrals for difficult-to-fill jobs.
- **Mission-Critical Skills Bonus** – An amount paid to existing employees whose skills are needed in a mission-critical area. This bonus is designed to retain staff.
- **Skills Acquisition Bonus** – An amount to be paid to existing IT employees who acquire key skills as approved in their individual training plans.
- **Mission Critical Project Bonus** - An amount to be paid to employees who complete a pre-approved mission-critical project.

The cost to implement a bonus program for IT professionals will depend on the criteria established, the number of employees affected and the extent of compensation offered. As an example, to implement the Mission-Critical Skills Bonus, the Skills Acquisition Bonus and the Mission Critical Project Bonus, assuming that 10 percent of the IT workforce would receive a bonus equivalent to 10 percent of their salary, the cost would be about 1% of payroll or approximately $4 ½ million. As noted in *Appendix G: Training and Bonus Cost Estimations*, if the bonus programs affected 15 percent of the population and the bonus averaged 15 percent of salary, the cost would be about 2 ¼ percent of payroll or approximately $10 million.

The cost to implement the Signing Bonus program will depend on the number and quality of candidates hired. Assuming 300 employees are hired from outside of state service yearly with 50% of them receiving an average signing bonus of $7,500, the cost would be $1.1 million. If 1/3 of the hired employees were referred by current state employees and each referral were compensated with $750, the cost to implement the Referral Bonus program would be $75,000.

4. The DPA should review existing recognition programs and implement changes to broaden their use by all state agencies.

The DPA should evaluate and expand alternative recognition program to all departments. Management, within budgetary resources, should be able to administer recognition activities suited to the needs of its individual work groups and employees.

5. The DPA should review the applicability of the recent federal overtime exemption from the Fair Labor Standards Act's (FLSA) for IT employees.

State civil service employees are subject to the Fair Labor Standards Act (FLSA). The area of greatest concern for IT employees is the cap that FLSA places on overtime pay. Employees at the senior technology levels cannot receive overtime pay. They can informally adjust their work hours to maintain an average forty hours of work time per week. However, in most instances, these highly technical (super-tech) employees are needed on the job and departments cannot afford to let them use all the time off that they have "informally" earned.

In 1996, Federal legislation created an FLSA wage and hour exemption for IT. This was done as a means to help relieve the work pressures being caused by the shortage of IT professionals.

California SB 1872 (McPherson) proposes to amend the State Labor Code to conform with FLSA regarding the IT exemption. However, state civil service is not subject to the California Labor Code. Therefore, the DPA should review the provisions of the FLSA and determine if the State can provide overtime pay to senior technology experts for mission critical work. In this review, the DPA should reinstate departments' ability to "reallocate" employees to a work week group approved for overtime pay.

6. The DPA should review and update benefit programs to enhance IT recruitment and retention.

The DPA should review state benefit programs with regard to their impact on IT recruitment and retention.

In the past, state benefits have been considered very good. However, these benefits need to be reexamined in light of the new and younger labor market that is emerging. Today, employees are attracted by flexible work schedules and work style practices that permit them flexibility to be mobile over the life of their careers. The new workforce is more willing to change employers over their working years.

Although the State has several innovative work programs such as telecommuting and alternate work weeks, these are not universally promoted across all state departments. The DPA should emphasize the benefits of implementing such programs as part of the State's recruitment efforts.

The State's Tier 2 retirement package is not as attractive to many IT professionals as the stock options oftentimes available in the private sector. The DPA should establish a defined contribution 401(k) plan for IT workers, similar to the plan that has been implemented for state correctional officers and firefighters. This would provide an additional enticement for private sector workers who could bring their 401(k) plans over into state employment.

The DPA should review procedures regarding payment for individual and group professional memberships and per diem payment for attendance at organization meetings and luncheons. IT professionals look to professional organizations for career enrichment, networking, and information on new technologies. These kinds of activities are another form of IT training. The State benefits by having a

well-informed and professionally connected workforce. This is a relatively inexpensive benefit that would be attractive to IT professionals.

EMPLOYEE SELECTION PROCESS

Research Findings

An efficient selection process is key to the recruitment of IT professionals in today's marketplace. It should give an organization the ability to identify and make job offers to the best candidates quickly. This results in:

- Increased productivity as employees are hired and can start their job duties as soon as possible.
- Reduced stress (and likely decreased employee turnover) on existing employees who are working more hours to cover vacant positions.
- Decreased costs for temporary contractors required to augment vacant staff positions.

"The State's examination process is decentralized, slow and highly dependent on intra-departmental coordination. It is not able to respond to rapidly changing business needs."

Finding people with the right skills to meet job requirements and business needs is challenging for IT managers and human resource professionals. The selection process utilized to recruit staff needs to run efficiently in order to expedite the placement of candidates into assigned positions and responsibilities. Delays in the selection process can result in the loss of candidates to more expeditious competitors, resulting in high recruitment costs for the State.

Demand for IT Positions

The demand for IT professionals is well documented. A recent study, conducted by Virginia Tech, indicated that an estimated 346,000 computer programmer and systems analyst positions are vacant in the U.S. for companies with more than 100 employees.[39] The U.S. Labor Department reports from now until 2005 an average of 95,000 new computer scientists, system analysts, and programmers will be needed every year.[40] In addition the Gartner Group reports that "graduates with Computer Science degrees quickly find jobs. In many cases, especially in regions with a high concentration of employers, enterprises, contract programming firms, and systems integrators are waging a bidding war for college recruits and driving prices higher."[41]

At a July 1998 State Personnel Board hearing on IT recruitment and retention, the Chair of the Computer Science Department of the California State University at Sacramento testified that she was aware of high school graduates being hired by private sector employers. These students were offered higher compensation than the State pays its entry-level IT technical staff. In addition, the State requires a college degree for these entry-level positions.

In order to recruit experienced or entry-level IT candidates, the State must recognize that they are competing with the private sector and other public agencies for the same candidates. Quick examination of qualified candidates is vital in this intensely competitive labor market.

Technology Innovations for Employee Selection

Matching the right job requirements with candidate qualifications is a labor-intensive process for human resources and IT managers. The use of automated applications and screening processes is increasing nationwide. A Human Resource Magazine survey of 210 companies concluded that approximately 93 percent of survey respondents, "expect to use the Internet more intensively for recruiting in the future."[42] This includes the use of automated screening processes to collect and evaluate applications. Automated resume databases provide a competitive edge by quickly searching for key skill set words to identify potential candidates.

The Internet is growing in popularity as a resource for marketing, recruiting, and selecting employees. By the year 2002, it is estimated that the United States will have approximately 77 million Internet users.[43] In addition, the U.S. Labor Department has recently committed to spend $8 million to create a large Internet site where employers can post job openings and candidates can post their resumes.[44]

Hiring Student Interns

One of the primary ways to fill entry-level positions is to hire students into internship positions. Upon favorable performance, these students may be later transitioned into permanent positions. A Computerworld magazine survey of 240 companies identified the key attributes of the best recruitment and retention strategies for interns.[45] The top 25 employers offered mentoring programs, well-developed career ladders, and recruitment incentives.

One example of this is the Hewlett Packard Corporation's Student Employment and Educational Development (SEED) program. Hewlett Packard places students into the SEED program early in their academic studies, and the most qualified students may be offered relocation allowances and medical insurance. HP reports that they are able to retain 53 percent of all student interns as they complete the SEED program. The success of this program is largely due to the mentoring effort done by HP. Student interns are able to demonstrate their skills, knowledge, and capacity to engage in a line of work that is consistent with their curriculum and consistent with their future employer's business strategies.

Current State Environment

The State's civil service hiring process for IT employees is not responsive to the rapidly changing business needs of state government. There are a number of barriers that currently inhibit the State's ability to compete with the private sector and other public agencies in selecting IT staff. These barriers include:

- A decentralized process for staff recruitment, referrals, and testing which does not foster collaborative ventures.
- Time consuming civil service examination and eligible list certification processes.

- A pay structure that doesn't broadly acknowledge the cost of mission-critical skills.
- Limited use of centrally-administered, continuous testing for IT positions.
- Restrictive "time-in-grade" and education level minimum qualifications which "screen out" otherwise qualified candidates.
- Limited use of on-the-spot hiring practices in state service. The current practice is inconsistent and needs much broader application.

These barriers contribute to a selection process that is time consuming and burdensome.

"Departments are not using centralized testing or continuous testing protocols as a means of having candidates "list ready" for on-the-spot hiring decisions."

Decentralized Processes

Of the departments responding to the Task Force Survey, 68 percent indicated they do not participate in centralized examination processes. In addition, 47 percent indicated they do not participate in cooperative IT examination processes. Cooperative or multi-departmental examinations are those in which two or more departments band together in the administration of a particular examination and share the results. This decentralization of the selection process fails to capitalize on the efficiency and cost savings resulting from economies of scale available through a centralized process.

Ninety percent of departments surveyed indicated they participate in independent testing. Departments are not using centralized testing or continuous testing protocols as a means of having candidates "list ready" for on-the-spot hiring decisions.

The California Department of Transportation (CalTrans) has used on-the-spot job offers in combination with open, continuous testing exams for hard-to-fill engineering classifications. CalTrans conducts extensive educational recruitment efforts encouraging potential applicants to take open, continuous exams for the entry-level engineer classifications. The exam is given on the Internet and applicants can file at their convenience. This Internet process is especially convenient for out-of-state applicants. CalTrans then compiles lists of potential candidates and sends out invitations for interviews. If there are a significant number of candidates from a specific college, interviews may be scheduled at that college.

The CalTrans model demonstrates what can be done within the confines of state civil service requirements, if a department utilizes the inherent flexibility of the system to hire in critical skill areas. The ability to offer employment on-the-spot requires flexibility in civil service selection procedures.

An informal poll in 1997 of National Association of State Information Resources (NASIRE) members showed a strong desire for more flexible hiring techniques similar to the CalTrans model.

The Selection Process Is Not Timely

State agencies must use automated evaluation and examination processes to ensure that the best available talent will be quickly evaluated and selected. All respondents to the Task Force Survey indicated that they want IT job listings available on the Internet.

"...an average of 6 months is required to issue the exam bulletin, test applicants, rank candidates, and fill an IT position."

According to the agencies surveyed, 53 percent indicated that an average of more than 90 days elapse from the time exam bulletins are posted to when eligible lists are released. This number did not fluctuate greatly when the median number of days by skill set category was calculated (see Figure 4: Median Number of Days to be Placed on an Eligible List).

Figure 4: Median Number of Days to be Placed on an Eligible List

Category	Median Number of Days to Be Placed on an Eligible List
Application Programming	90
Client Technical Support	75
Computer Operations/Data Guidance	60
Database Management	90
Internet	90
Management	100
Network Administration	90
Operating Systems Support	90
Telecommunications	90
Training	60

An additional 98 days are required to fill an IT vacancy from the eligible list. As a result, an average of 6 months is required to issue the exam bulletin, test applicants, rank candidates, and fill an IT position.

The State must recognize that this lengthy selection process increases the risk of IT project failures. Vacant positions increase agencies' exposure to network failures, software failures, and the inability to meet scope, schedule and budget on development projects and existing system maintenance.

Recruiting Students to State Service

State government agencies hire student assistants to fill the gaps to support general technical tasks. Students usually remain at the various agencies until either funds are exhausted or the student graduates. In many instances, state agencies provide limited mentoring or college planning for their student assistants. This is contrary to best practices seen in the private sector such as the Hewlett Packard SEED program.

The Task Force Survey indicated that 92 percent of the departments utilize student assistant positions for IT services. They believe student assistants represent a "rich source" of potential candidates for hire. Unfortunately, 80 percent of the

departments responding indicate that they do not feel that they have been successful in transitioning student assistants into permanent civil service positions.

Recent Developments

In recent years, several innovations have occurred in the selection process. The State has begun to aggressively use Internet technologies to attract employees to civil service employment. The SPB has begun to centralize testing where it makes sense to do so and departments are willing to pay for these services. Currently, SPB reports that its web site receives 2 million "hits" each month. Centrally administered and open testing for IT classes was supported by 93 percent of the Task Force Survey respondents.

"Centrally administered and open testing for IT classes was supported by 93 percent of the Task Force Survey respondents."

In addition, two state data centers are now using demonstration projects to improve IT recruitment and retention. These demonstration projects have focused on skill set acquisition rather than a generic selection process based on time-in-grade and educational level minimum qualifications. Informal feedback from these innovations has been favorable.

An excellent example of Internet services offered by the SPB is the continuous Internet examination process for the Associate Programmer Analyst (Specialist) and Associate Information Systems Analyst (Specialist). The SPB reports that approximately 120 applications per month are being received for both exams. These exams are scored on a weekly basis. Applicants with passing scores are added to existing eligibility lists for these classifications. Departments can participate in this cooperative examination process by paying a $2,350 fee to the SPB.

More departments need to be encouraged to take advantage of centralized examination process such as these.

Problem Statement

The State's examination process is decentralized, slow and highly dependent on intra-departmental coordination. It is not able to respond to rapidly changing business needs.

Recommendations

1. The SPB should centrally administer open, statewide, continuous filing and testing IT examinations on the Internet. Consistent with the current Associate Information Systems Analyst (AISA) and Associate Programmer Analyst (APA) exams as models, the SPB should:

- **Limit the number of ranks on the resulting eligible lists;**
- **Give departments on-line access to eligible lists by skill set; and**
- **Assist departments in the development and use of effective on-the-spot hiring techniques for recruiting IT professionals.**

SPB should provide departments with the alternative to participate in these Internet exams for information technology classes. Additionally, all job openings should be continuously advertised on the Internet.

The benefits of such an approach include:

- Reduced examination costs - Exams administered via the Internet, eliminate the need to acquire examination facilities and staff them with exam proctors and reduce the time and cost associated with the physical handling of examination material.
- Reduced processing time to establish eligibility lists - As demonstrated by the SPB, approximately 10 weeks of processing time can be saved if agencies utilize the continuous Internet examination process. Examination posting is immediate and continuous. Exams can be scored on a weekly basis. Agencies can request certified eligibility lists from the SPB when IT talent is required.
- Access to a more educated, more geographically diverse, and larger pool of applicants - State agencies should be capable of quickly notifying and examining qualified IT candidates to compete with the private sector. The United States will have approximately 120 million Internet users by 2001. State agencies must be able to reach potential applicants quickly and effectively.

Limit the Number of Ranks

For most current examinations, candidates receiving passing scores on the exam are assigned a rank based upon their potential to successfully perform the job duties. Typically, most examinations use up to nine individual ranks. In extreme cases, up to 30 separate ranks can be used in an exam. However, only those candidates in the top 3 ranks are considered "reachable" for current state openings.

There are at least two basic flaws with this approach. First, state classifications describe a generic set of duties and responsibilities. With up to 30 separate ranks (or even six to nine ranks), it is extremely difficult to ensure that there will be candidates with the necessary technical skills and knowledge available in the first three ranks ("reachable ranks") to satisfy specific job requirements. Secondly, the State's testing tools are not sufficiently accurate nor sophisticated enough to make fine distinctions among candidates.

IT managers must have an adequate pool of eligible candidates from which to select employees. In order to make the most effective and efficient use of eligible lists, the number of ranks must be greatly reduced. This will provide access to a larger number of the most qualified candidates.

Many departments have already limited the number of ranks they use. There are no civil service laws or rules that require a certain number of ranks to be used. Current regulations only require that the exam process is "competitive" and that ranks are based on the final scores of the candidates. Both of these requirements can be met, along with the managers' requirement of having the largest possible

number of highly qualified candidates for their specific job, by limiting the number of ranks.

In limiting the number of ranks, departments should only put individuals on the lists that are truly the most highly qualified candidates. Candidates that are not considered the most highly qualified at the time of the exam should be permitted to "recompete" after a reasonable period of time. That time period may vary, depending on the IT classification.

Provide On-line Access to Eligible Lists by Skill Set.

If the number of ranks on eligible lists is reduced, there will be many more candidates from which to make a hiring decision. Hiring managers must be provided with a method by which the large number of eligible candidates can be "prescreened" by the skill sets they possess. This will allow them to use their time efficiently in the hiring process. They will only need to consider those candidates who possess the critical skills that are required for the job.

Develop and Use On-The-Spot Hiring Techniques

Another advantage of this centrally-administered Internet testing approach is that it will provide hiring managers the opportunity to make on-the-spot job offers (subject to any required medical or other clearances).

Frequently, experienced IT candidates may be considering several job offers at the same time. To be competitive, the State needs the ability to offer employment immediately after an interview has been conducted. The ability to make on-the-spot employment offers has the following benefits:

- Reduces the possibility of losing an IT candidate to a competing employer.
- Demonstrates the earnestness of the state IT commitment.
- Accelerates the hiring process.
- Reduces the cost of staff turnover.

2. The DOF should provide the SPB with funding for the development and administration of central, statewide, open Internet testing for IT classifications.

Currently, the SPB does centrally administer some statewide open examinations. In these cases, departments wishing to utilize the resulting eligible lists must enter into a contractual agreement with the SPB and pay their "fair share" for the development and administration of the exam. Because the SPB receives very limited support from the General Fund for centralized testing activities, it must be reimbursed for its services by participating agencies.

This method of funding centralized examinations is not cost effective. Additional costs are incurred as a result of each department having to enter into individual contracts with the SPB for centralized exams. These costs include personnel time and materials for both the SPB and participating departments. In addition, each agency has to negotiate, approve, and monitor its contract with the SPB. The SPB

also must monitor payments and collections from each agency. This current reimbursement process is time consuming and expensive.

3. The SPB, in concert with user departments, should improve the Student Assistant and Graduate Student Assistant transition process.

State agencies have begun to take an active role in hiring IT students through formal college intern programs. They are working with the colleges and universities to:

- Develop critical expertise in training and motivating students.
- Provide a climate conducive to learning and growth.
- Deepen involvement with the colleges and universities. This may include influencing the curriculum taught and; when possible, aligning each student's curriculum to meet the agency's IT strategies.
- Endow guidance for interns and teachers.
- Select highly motivated interns as potential permanent employees.

The State must develop an effective transition process into permanent civil service positions for Student Assistants and Graduate Student Assistants in order to leverage it's investment in valuable training time and money. Upon graduation, these students are more likely to remain with the State if we have participated in planning their career objectives and have an immediate means to secure their future employment.

4. The SPB and DPA should develop training on "how to hire" for IT managers.

IT managers need training on how to make quality hires. This should include specific interviewing techniques (e.g., competency-based interviewing).

Currently, many IT managers are not equipped with the knowledge nor have the ability to make good personnel selections. Historically, the State has not provided training to its managers on how to hire staff. All new state supervisors and managers are required, by law, to attend 80 hours of training in a variety of specific areas. Unfortunately, "how to hire staff" is not one of the areas covered. Evaluating potential candidates is one of the most critical tasks that a supervisor or manager must perform. The quality of staff hired can dramatically affect the quality of IT services provided.

In the past couple of years, the State has undertaken an effort to train some managers in "competency-based interviewing". This technique is based solely on job-related competencies, not intuition or initial impressions. It is a behavior-based selection system designed to identify and hire competent and effective individuals. The State needs to identify other state-of-the-art selection techniques and train its managers in the effective use of such techniques.

Overall, the State should emphasize the training of its managers to make high-quality hiring decisions. Effective hiring tools and techniques should also be made available to IT managers.

5. The SPB should explore utilizing proactive recruitment strategies providing centralized recruiting services on a reimbursable basis for all state departments.

A good recruitment program has many facets. It should include recruiting activities on college campuses; Internet sites; trade associations; trade publications; professional conferences; newspaper classifieds; and job fairs. It also can include internships for potential college recruits. No single source can meet the constantly changing skill demands of a large IT organization.

The Task Force Survey of state IT organizations shows that an overwhelming 80 percent are in favor of establishing a central recruitment source for IT professionals. A central recruitment source would provide a richer recruitment program than any single department can on its own. Such a program could be reimbursable on a service provided basis or through annual interagency funding agreements with state departments.

A central IT recruitment function would provide the following benefits:

- Improved efficiency of recruiting IT professionals into state service.
- Provide potential applicants with a single source of recruitment information and job placement.
- Facilitate departmental searches for scarce IT skills.
- Provide improved screening of candidates for better job matches with departments.
- Provide an applicant-friendly hiring process.

JOB CLASSIFICATION SYSTEM

Research Findings

Based on its research and analysis, the Classification Task Force Subcommittee found that well-defined job classifications with clear career progression paths:

- Enable IT and human resource managers to recruit the "right" IT professionals to meet specific business needs.
- Help to ensure that IT employees acquire necessary skills for advancement and serve as a valuable retention tool.
- Allow IT and human resource managers to allocate effectively their IT personnel resources and improve the balance of IT skills within the organization.

"The State's IT classification structure does not adequately describe the current work and fails to accommodate the rapidly changing needs of the Information Technology industry."

Job Classifications as a Recruitment Tool

A clear job classification structure, accurate job descriptions, and relevant minimum requirements are essential for a successful recruitment and retention program. Inherent in this task is the need for careful review and assessment of the existing skill needs. Only when an organization takes stock of its IT resources requirements, can it begin to fill such needs. By carefully defining classifications, job descriptions, and minimum requirements, organizations can assist IT and human resource managers in recruiting qualified employees.

The Task Force Survey indicated that 86 percent of the responding departments would support minimum requirements for classifications based upon demonstrated knowledge and skill competency rather than current time-in-grade and minimum educational level requirements.

Several states have either recommended or actually restructured job classifications for IT employees. For example, the State of Texas Department of Information Resources recently submitted a Report to the Governor in which it recommended that the State "examine the job titles and job descriptions now in use for information resources personnel, eliminate obsolete titles associated with old technology and approaches to information resources, and add titles matching modern and emerging uses of information resources."[46] In addition, the State of Michigan reports that they will be piloting broadband pay for performance plan for IT professionals, which consolidates 22 current classifications into 3 classifications.[47]

Other public agencies facing similar challenges have restructured their IT job classification systems. For example, the State of Oregon conducted a classification study over a two-year period. As a result of the study, Oregon developed a broad classification band of eight levels delineating technical and professional non-supervisory information systems positions. British Columbia also undertook an

Information Systems classification study in 1993 resulting in a much simplified classification structure.

Job Classifications as a Retention Tool

By restructuring job classifications, organizations can develop multiple career paths for IT professionals. In doing so, organizations will address employee burnout and mitigate employee turnover. Well-developed career ladders and multiple career paths are fast becoming a retention tool employed by companies serious about retention. In Computerworld's 1998 review of the top 25 companies that excel at IT retention, companies such as Sears, Roebuck and Co. and Xerox Corp. both cited multiple or alternative career paths for IT professionals as an integral part of their retention programs. As noted, "Offering alternative career paths is becoming increasingly important as many organizations flatten the IS ranks. Quite simply there is less demand for traditional IS managers, but growing demand for highly skilled IS specialists."[48]

With well-defined and well-developed career ladders, IT employees can chart their own career progression. CSX Corp., another of the top 25 companies that excel at retention, went so far as to implement a browser-enabled tool to let people develop their own career map. As the CIO of CSX Corp. stated "If someone wants my job this tool helps them understand the requirements and paths to get there."[49] The advantage of clearly defined job classification structures is two-fold. Employees gain a sense of belonging within the organization and delivery systems improve as IT employees acquire more advanced skills to progress in their careers.

Job Classifications as a Resource Allocation Tool

In developing and modifying job classification structures, based on an analysis of necessary skills, organizations create a tool for resource allocation. When job classification structures accurately depict the necessary skills and the actual work to be performed, IT and human resource managers can place individual employees in positions where they can make meaningful contributions. This is in effect skills-based management. And as the Gartner Group points out, "Skills are what turn plans into actual creations, without them, nothing works."[50]

Current State Environment

Many of the current civil service job classifications for IT professionals were established in the mid-1970s, when virtually all of the information technology work was performed on large mainframe computers and the programming and systems work was separate and distinct. These classifications delineated positions based on operations, programming, systems software and information systems work. Since 1975, dramatic changes have occurred in the technological environment in California state government, as well as the nature of the work. As such, current IT job classifications no longer accurately represent the actual work performed.

Although large mainframe systems are still in place at the State's data centers, there are also local area networks (LANs) and wide area networks (WANs) with servers, routers and PC-based software that require support and maintenance. As a result, the State must keep legacy systems operating in order to meet the public service needs of today, and at the same time, develop and install new systems to keep pace with current technology and provide continued service improvements. This two-fold challenge requires a more diverse workforce.

Since current classifications do not accurately depict the work to be performed, they provide no value to IT and human resource managers in filling the IT skill(s) needs of their agencies. Not only do outdated classifications hinder the ability to recruit the "right" IT professionals, they do not provide a clear progression for skills acquisition and career development. Over 92 percent of the respondents of the Task Force Survey indicated that they believe that the current classification structure inhibits their ability to hire and retain qualified IT staff. Successful recruitment and retention of a well-balanced work force of IT professionals prepared to meet the State's technological needs can only be accomplished by making much needed changes to the current job classifications.

"Over 92 percent of the respondents of the Task Force Survey indicated that they believe that the current classification structure inhibits their ability to hire and retain qualified IT staff."

The current state classification structure and number of employees per class as of September 3, 1998 is illustrated in *Appendix D: Employee Count By Classification*. This appendix illustrates that even though the classification structure has 61 classes, over 38 percent of state IT employees fall into only two classes: Associate Information Systems Analyst and Associate Programmer Analyst.

While the need for changes to the current civil service job classification system cannot be overstated, several California state agencies have recognized the need for and have implemented changes to their job classification systems. The efforts of these agencies can serve as pilot projects and lessons for other state agencies to follow. For example, the State of California has classification demonstration projects currently approved and operating in two of the State's data centers. The Health and Welfare Agency Data Center (HWDC) began using consolidated classifications in their technical and professional series in July 1997. The HWDC recently surveyed its employees and compared the results to a similar survey conducted in 1994. The survey results show:

- Employees are more satisfied with their job duties at HWDC;
- Management feels this classification structure more accurately represents the work being performed by employees; and
- The classification system allows HWDC management wider flexibility to assign employees where they are needed.

The Legislative Data Center followed suit in early 1998, with essentially the same classification structure. Both data centers consolidated their information systems, programming and systems software series into one classification (breadth), with five ranges in the entry or basic class and two class levels above that (depth) encompassing what used to be the Assistant Information Systems Analyst (Range A) through the Systems Software Specialist III. There is also a consolidation in the operations area, affecting Information Systems Technicians and Computer Operators, through the Computer Operations Specialist II level. These classes were consolidated to reduce examinations for upward mobility and to provide

greater flexibility in job assignments. Employees move through the ranges based on acquisition and demonstration of competencies of skill sets. At the higher levels in the series, where opportunities for promotion are limited, examinations are still required.

Recognizing the concerns of practitioners and CIOs that the current job classifications are outdated, the DPA initiated and is currently coordinating a classification study of all civil service IT positions in the State of California. The DPA Task Force conducting this classification study is comprised of a combination of information technologists and human resources staff.

To date, the DPA Task Force has spent approximately one year gathering necessary data to describe current work performed in the IT occupations in state civil service. The DPA Task Force identified twenty functional areas, defined work components of the twenty areas and essential competencies. Targeted departments and subject-matter experts are validating the work components, linking essential competencies and applying allocation factors. The objective is to define a competency-based classification structure with inherent flexibility to adjust to the rapidly changing information technology environment.

Problem Statement

The State's IT classification structure does not adequately describe the current work and fails to accommodate the rapidly changing needs of the Information Technology industry, consequently:

- *The minimum qualifications do not provide for the selection of candidates with emerging competencies essential for business success.*
- *The structure limits employees' ability to develop competencies in emerging technologies and apply them to related work to improve their opportunities for career advancement.*
- *The structure restricts the departments ability to assign employees work in emerging technologies.*

Recommendations

1. The DPA and SPB, working with the DOIT, should reduce the number of IT classifications.

The current IT classification structure includes 61 different classes. Some of the classifications create artificial barriers to career development and hinder IT and human resource managers in recruitment and promotion. Simplifying and reducing the number of IT classifications will result in a well-defined career progression for IT employees that can be administered more easily.

2. The DPA and SPB, working with the DOIT, should redefine classifications to permit wider flexibility in the assignment of work and improved opportunity for employee career advancement.

A redefinition of IT job classifications will help to reduce the total number of classifications. In addition, this redefinition will help minimize inconsistencies within the current classification structure. The resulting structure should create clear and understandable job classifications for staff and managers in human resources and IT areas.

3. The DPA should eliminate the current IT allocation guidelines and develop a tool for allocating positions based on the organization's business needs.

New guidelines for allocating positions based on the organization's business needs will help to ensure that agencies are going through the necessary and valuable exercise of reviewing their existing IT skill(s) needs and projecting future needs. Such guidelines, developed by the DPA, will assist IT and human resource managers in skills-based management, as they are better able to utilize and develop employee resources, thereby improving the delivery of services.

4. The DPA should establish a "policy sounding board" on allocation guidelines to periodically review them for equity across departments.

Such a "policy sounding board" will help to ensure that agencies continue their business needs evaluations in a consistent manner. This sounding board will also help to maintain the quality of skills-based management both within state agencies and across departments.

5. The DPA and SPB, working with the DOIT, should create alternative minimum qualifications based on skill competencies and knowledge rather than current time-in-grade and educational level requirements.

The acquisition and demonstration of essential competencies are critical to differentiate those candidates who will excel at job performance and contribution. Establishing competency-based selection criteria represents a significant divergence from traditional selection standards.

The current pool of eligible IT candidates is restricted by time-in-grade and educational level minimum requirements. These current minimum requirements are frequently not the best indicators of a candidate's ability to perform specific IT job duties.

Establishing a skills-based selection process would improve the quality of candidates identified for specific IT work. In this new process, candidates would demonstrate the specific skills and knowledge required to perform the duties of the position.

The primary advantages of a competency-based system are that they emphasize essential knowledge, skills and behaviors in a dynamic work environment. It also provides employees promotional eligibility upon demonstration of readiness.

6. The DPA should create an IT classification structure that has inherent flexibility to adjust to the IT industry over time.

Rapid changes in the Information Technology field require equally rapid acquisition of new skills. An outmoded classification structure limits the ability to recognize new technological needs, and to subsequently train, hire and retrain staff to meet those needs. It also limits employee options to acquire and apply new skills. The DPA and SPB should establish a classification process or a dynamic structure, rather than the set structure currently in place. The structure should include mechanisms to modify classifications easily rather than merely establish specific classes. Such mechanisms should allow continual modifications to keep pace with the industry, while maintaining cohesion and the ability to determine comparable level of work.

7. The DPA should provide for the career and salary advancement of the "technical expert" commensurate with managerial levels.

Without such advancement routes, the IT professional is often stymied by a classification structure that does not reflect the work actually performed and does not adequately reward or promote the individual's efforts. A job classification structure that provides a well-developed career ladder for technical experts will define the various or alternative career paths that private sector enterprises are using to limit employee turnover.

8. The DPA should create an IT classification structure that provides for employee movement from entry-level to journey level based on acquisition and demonstration of skills rather than by examination.

Entry-level employees are hired with the expectation that they will ultimately progress to and perform at the journey person or "Associate" level. Current state practice requires that entry-level IT employees go through at least one or more formal examination processes in order to progress to the journey person level. In addition, employees must be in a "reachable rank" on an eligible list to advance to the next level.

The timing of employees' progression should be based on the achievement of the required level of competence rather than a formal examination. Currently, advancement though the beginning levels is allowed in some classifications without formal examinations.

PROFESSIONAL DEVELOPMENT

Research Findings

Research findings of the Task Force Subcommittee on Professional Development confirmed that professional development programs are crucial to the retention of IT professionals. Among other things, a well-planned and well-funded professional development program results in:

- Increased employee satisfaction and loyalty, resulting in decreased employee turnover.
- Reductions in employee burnout as employees acquire new skills, enabling them to make career advances.
- A belief among employees that their employer values their contribution and seeks to meet their needs.
- Increased productivity and flexibility as employees increase their skill base and apply those skills, as necessary, to various technology projects.
- Risk management of IT project failures as employees develop necessary skills to handle complex technologies.
- Increased costs savings and economic growth.

"There has been insufficient action taken by the State of California in recognition of the importance of on-going professional development..."

As the Gartner Group concluded, "Enterprises should think of skills management as an ongoing program of investing in employees to make them more valuable to the enterprise as well as to boost their careers. Such investment forms a key element of retention." [51]

Combating Employee Turnover

As documented throughout this report, recent years have produced unprecedented information technology (IT) advances. Accordingly, the opportunity to keep his/her skills in line with the constant and dramatic change in computer technology is an increasingly strong motivator for the IT professional in accepting and staying in a job. In a recent study, employees of Silicon Valley companies cited continuous learning as the most important factor in their employment decision.[52] According to Computerworld's 1998 Jobs Hiring Forecast, lack of training opportunities was one of the top reasons cited by managers for information systems (IS) turnover.[53]

Recognizing that training opportunities are essential to IT retention, corporate enterprises have made professional development an integral part of their retention programs. In a list of the 1998 top 25 companies that excel at IT retention developed by Computerworld magazine from a review of the Fortune top 100 companies, training programs were cited as a common denominator for retention success. For example, Xerox, cited by Computerworld as one of the top 25, has implemented skills development as one of the elements in its four-pronged retention program. As the director of human resources at the IS department at Xerox stated, "We have learned [from our surveys] that for employees, maintaining technical and business skills is very important. So Xerox has

loosened its purse strings and now funds almost any educational program that has a job connection. In practice, he says, that has meant providing full funding for employees seeking certification or individual courses, as well as those chasing their master's degree."[54]

Apparently, any concern that such "free" training would result in a mass exodus of employees has not actualized, as Xerox is listed as number one of the top 25 companies that excel at IT retention. Further, other top 25 companies featured in Computerworld's report consistently emphasized training as part of their retention program. According to Computerworld, attrition rates for these top 25 companies are mostly in the single digits, sometimes the low single digits. This contrasts with the State of California IT organizations, where the vacancy rate is currently 19 percent, with an additional 5 percent of positions being filled with underqualified staff.[55]

Professional Development Contributes to Cost Savings and Economic Growth

The far-reaching impact of training programs as a means of retention cannot be understated. The resulting decreases in IT employee turnover result in a more productive, flexible IT staff, which in turn leads to increased costs savings and economic growth. According to the United States Commerce Department, as much as 50 percent of the recent growth in the U.S. economy, at its strongest point in years, is due to the growth in the technology industry and cost savings from the use of computers. As the Deputy Assistant Secretary for Technology Policy stated, "It [technology] is the most important enabling industry." [56] In order to take advantage of advancing technology and to improve economic growth, enterprises must develop well-trained IT staffs.

With a sufficient blend of IT skills available, the likelihood that complex IT implementation projects will fail decreases, as IT employees are equipped to handle increasingly complex technologies. Moreover, the organization is better able to implement technology advances and capitalize on the results. On the other hand, when projects fail because employees are not equipped to handle the technologies, morale suffers, resulting in increased turnover and hard-to-fill vacancies. A new nationwide survey shows that 1 in every 10 information technology jobs in the United States is unfilled.[57] The Gartner Group estimates that the cost of employee turnover is roughly equivalent to one person's salary in hard costs – i.e., recruiting fees, management time, higher salaries for new hires and lost productivity during training.[58] When technology jobs remain vacant, enterprises are not able to implement costs savings technology projects and cannot continue to remain competitive. When weighing the costs of training against the cost of turnover and lost technology opportunities, training investment wins.

Funding Professional Development Programs

Those companies successful in recruiting, and more importantly, retaining the best and the brightest IT professionals are willing to make substantial investments in professional development. In recognition of the growing importance of

training programs to recruiting and retaining quality staff and, by extension, improving the success rate for their IT projects, private sector companies are correspondingly increasing their employee training investments and incentives. In Computerworld's feature of the top 25 companies that excel at IT retention, the average annual training investment per employee is 15 days and $6,200[59].

Addressing the same topic, the Gartner Group reports that the best-performing companies spend an equivalent of 7 to 10 percent of their IT payroll to train their IT employees, and well-performing companies spend a minimum of 5 percent. Gartner research also shows that companies spending an equivalent of 6 percent of their IT payroll on employee training, have half of the employee turnover experienced by companies spending 2 to 3 percent. Looked at another way, organizations typically spend an average of $3,000 annually per IT professional for training and the well-trained IT organizations spend an average of $5,000. Further, companies that spend a higher percentage on training, have relatively lower overall IT costs.[60] Both Computerworld and the Gartner Group stressed that successful enterprises base their training investments on employee training plans tied to corporate strategic goals, and that the tie to corporate goals is an important factor in employee satisfaction and their decision to remain in a job.

"..companies spending an equivalent of 6 percent of their IT payroll on employee training, have half of the employee turnover experienced by companies spending 2 to 3 percent."

Although slower in reacting to the dramatically changing IT environment than the private sector, some state governments are taking steps to increase their commitment to and investment in IT employee training programs in order to recruit and retain quality IT staff. For example, Kansas has instituted employee "skills acquisition bonuses" in addition to its regular training investment. If the employee leaves within one year of receiving the bonus, he/she must return half of the amount.[61]

The State of Ohio is building a technology-training fund of as much as $12 million by setting aside up to 15 cents for every hour worked by state employees. This is over and above the Ohio Departments' current IT training efforts.[62] In Missouri, among other actions, officials have partnered with the State's colleges to provide certification programs that meet state training needs.

Professional Development Programs

As the computer environment has become more complex, training programs have also evolved with an increased emphasis on more specialized training in highly technical areas. Training "certification" programs apply industry standards and are becoming an increasingly important part of individual employee development plans. Such certification programs are offered, consistent with the standards established by the Institute of Electrical and Electronics Engineers (IEEE) and the Project Management Institute (PMI) for network administration, operating system maintenance, and the use of application development tools.

Computer-based training (CBT) programs, where enrollees learn specific skills at their own pace either via on-site media - usually CD ROM - or via Internet subscription services, are increasingly being used by organizations to supplement classroom programs. For instance, RHI Consulting, an international company that specializes in supplying contract professionals, offers new employees extensive

CBT training after just 100 hours of employment. Classroom training is offered after 500 hours and full certification programs are available after 1,000 hours employment, if the employee is willing to commit to RHI for an additional 2,000 hours.

In addition, Gartner Group states that one of the critical success factors in the retention of staff is a manager skilled in managing people, expectations, and resources.[63]

Current State Environment

California state government, has not made a concerted effort to ensure an appropriate level of continuous development to attract and retain quality IT professionals. As opposed to the $6,200 annual training investment per IT employee averaged by the top twenty five private sector companies, the $5,000 spent by well-trained organizations or even the $3,000 that Gartner Group says is spent by the typical organization, California state departments spend an average of just $1,300. Expressed in other terms, while the Gartner Group recommends a minimum of 5 percent equivalent of IT payroll, the expenditure level for California state employees is just 2.9 percent. The California state department statistics are based on the Task Force Survey results. Figures 5 and 6 illustrate the differences.

Figure 5: IT Training Expenditure Per IT Employee

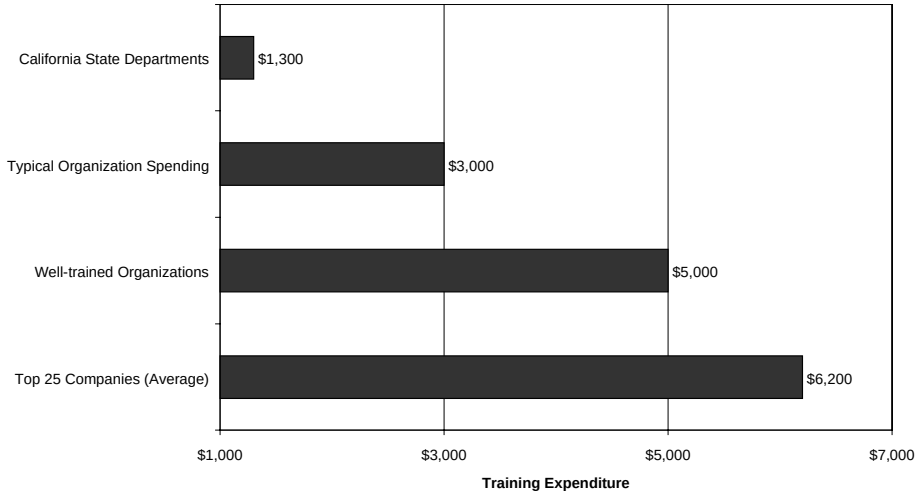
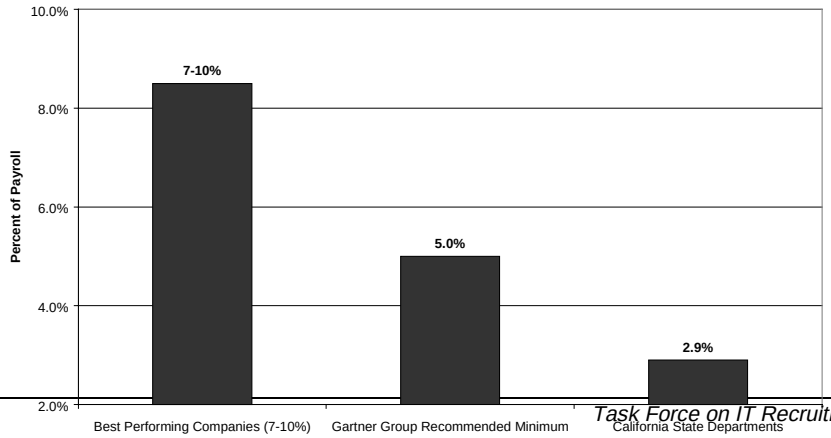


Figure 6: IT Training as a Percentage of IT Payroll



Also, California has not yet implemented the skills retention bonuses and other employee training incentives that states like Kansas, Ohio and others have to attract and retain quality IT staff. The Task Force Survey further indicated that annual training plans tied to departmental strategic objectives are not consistently developed for IT staff and that training funds are often diverted to cover other operating expense pressures.

"..state IT managers have often been forced to decide between training technical staff to support mission-critical systems or providing management training."

With the limited funding available for training, state IT managers have often been forced to decide between training technical staff to support mission-critical systems or providing management training. In addition, many management positions have been filled with staff possessing excellent technical skills but with less-than-adequate knowledge in resource or project management.

Recently, the State of California established the Governor's 21st Century Training Action Team. [64] While the Team's scope encompassed the training of state staff, in general, in advancing technology leading into the next century, computer technology was most prominently referenced in its February 1998 report entitled, *Developing A High Performance 21st Century Workforce For California Government*. The report also cited experts who have found that, for every dollar invested in training, up to three dollars is returned in savings. Although not yet implemented, the report recommendations included, in part:

- The establishment of guidelines for integrating a workforce development component into each Department's strategic plan;
- The development of standards against which the training investment might be measured;
- The establishment of the California State Library as a repository for computer-accessible training materials; and
- The establishment of a master services agreement as a vehicle for acquiring training courses more economically.

Problem Statement

There has been insufficient action taken by the State of California in recognition of the importance of on-going professional development to the recruitment and retention of a cost effective, highly qualified and productive IT workforce. Insufficient funding and maintenance of IT skills results in the inability to develop, maintain, and deliver quality networks and applications on time and within budget in a rapidly changing environment.

Recommendations

1. The DPA, working with the DOIT, should establish a statewide policy requiring that departments develop annual training plans that support their strategic objectives. The training plan should include assessment of current skills against required skills necessary to accomplish objectives.

The top private sector companies have considered this practice essential to success. It has been also cited as an important ingredient to employee satisfaction

and retention and it is consistent with the recommendation of the Governor's 21st Century Training Action Team. According to the Task Force Survey, this is not consistently being done within California state departments.

The DOIT role in the development of annual training plans remains consistent with the department's identified role, "The secretary [DOIT] shall continue to develop plans and policies in a coordinated fashion regarding all of the following... (b) Information management personnel, including training and qualifications of those personnel."[65]

2. The DPA, working with the DOIT and the DOF, should establish a standard, based upon industry standards, for annual training dollars or number of training days per IT employee. This standard should be evaluated and adjusted annually, as necessary.

The Governor's Training Action Team identified the need for standards against which training expenditures could be measured in meeting strategic objectives. There should be a standard process for the measurement of the impact of training expenditures on strategic objective accomplishment as the year progresses. However, to ensure the successful implementation of IT-based strategy initiatives, a standard rate should be established for pre-year budgeting, based upon what successful organizations are spending in the industry. The Task Force Survey indicated that the current annual IT training investment by state departments expressed as a percentage of payrolls, is 2.9 percent. By contrast, the industry practice for well-performing companies, according to the Gartner Group, is a minimum of 5 percent. Best performing companies, as the norm, invest 7-10 percent and 15 days.

Therefore, consistent with the responsibilities outlined by the Governor's Training Action Team, the DPA, working with the DOIT and DOF, should establish annually, the dollar amount and / or the number of training days per IT employee to be used as a standard by departments for budgeting. That amount should be expressed as a percentage of IT payroll and be applied to IT employees.

3. The DPA, jointly with the DOIT and the DOF, should develop a policy for issuance by the Governor's Office, that departments budget an amount each year solely for the purpose of funding the IT training expenditure standard for annual training dollars/days.

An executive-level policy is needed to ensure that the standard for IT employee training investments, to be developed each year by the DPA and DOF per recommendation 2 above, is followed. It is also necessary to isolate IT training funds through policy to avoid the problem of IT training dollars being caught up in the common departmental practice of sacrificing training funds to cover other operating expenses. It is suggested that DPA and DOF prepare the policy for the Governor's Office, in keeping with the statement of responsibilities recommended by the Governor's Training Action Team.

The survey conducted by the task force indicated that departments are currently investing approximately 2.8 percent of their payroll expense, or about $12 million

statewide, on the training of IT employees. As discussed above, the minimum investment in training should be in the 5 percent range. For the state to be a leader in the development of their IT employees, we would have to invest between 7 percent and 10 percent of our payroll expense. In order to increase our investment to 5 percent, we would have to commit approximately $11 million more statewide to training. To increase our investment to 8-½ percent, would require approximately $26 million more per year. See *Appendix G: Training and Bonus Cost Estimates* for costing details.

4. The DPA, working with the DOIT and the DOF, should sponsor legislation to allocate training dollars for 2 years to compensate for the training shortfall that has occurred in the past several years.

To provide sufficient lead time for departments to develop training standards, there should be a two-year authorization of funding to compensate for the training shortfall in the past several years. The importance of this "catch up" training investment and the need for immediate action is magnified by the State's increased dependence on information technology. Public and private sector partners apply constant pressure for state departments to keep current. An immediate investment in IT staff training should be required if the State is to respond effectively.

Consistent with the estimates made above, the state should allocate approximately $26 million the first year and $11 million the second year in additional training funds. This would give departments an opportunity to make up for past neglect in the first year and achieve the minimum recommended training investment level in the second year. The total 2-year cost would therefore be approximately $37 million. See *Appendix G: Training and Bonus Cost Estimates* for costing details.

5. The DPA, working with the DOIT and appropriate agencies, should establish agreements with the California State Universities and/or UC Extension programs to offer a cost-effective consistent IT curriculum of industry-recognized IT certifications supporting state core technologies. These agreements should be established for service in at least four major metropolitan areas; San Francisco, Sacramento, Los Angeles, and San Diego.

As technology advances and the computer environment becomes more complex, specialized training through a series of focused courses becomes more important. Receiving specialized training via industry-recognized certifications, e.g., Novell or Microsoft engineering, through the product manufacturers or training vendors can be expensive and require extensive travel.

Also, while there are numerous industry-recognized certification programs offered independently by some colleges and universities as part of their on-campus or extension programs, they may not be consistently offered in the major metropolitan areas or be the certifications programs supporting the current core technologies employed by the State. The DPA should follow the lead of Missouri and other states to engage colleges to offer a cost-effective certification program, consistent among major metropolitan areas, reflecting the core technologies employed by the State.

6. The DPA, working with the DOIT, and the DOF should institute a reimbursement program for employees that acquire professional certification and offer skills acquisition bonuses for completed certification.

If an employee acquires a certification that is approved in his/her training plan and does it off state time, either independently or as part of a computer sciences degree program, the employee should be reimbursed for the cost of tuition and materials. The reimbursement would not exceed the equivalent cost of attaining the certification through the college partner program proposed in Recommendation 5 above. The employee should be eligible for any skills acquisition bonuses that are recommended in the Compensation section of this report.

7. The DPA should establish a statewide policy aimed at recapturing a portion of certification training costs if an employee separates prior to a designated time frame.

Because of the relatively expensive cost of certification training programs and the high demand for skilled employees, it is becoming a more common practice to require that recipients of employer-funded certifications commit to continue employment for a period of time after receipt. RHI Consulting, for example, requires a commitment of 1,000 additional hours of employment, while Kansas requires that recipients of skills acquisition bonuses repay half if they leave within 1 year. In many cases, the enterprise courting the employee is willing to "buy out" the employee's commitment. While the employee may be difficult to replace, at least the losing organization isn't subjected to double-jeopardy - the loss of the employee and its entire investment.

It is therefore recommended that IT employees receiving state-funded certifications repay all or a portion of the cost of tuition, books, and materials if they leave within a specified period of time of receipt of the certification. In the case of movement between state departments, the recipient department would be required to repay the losing department's investment. Exceptions to repayment might be allowed under certain conditions (for example, in the case where a promotion is offered that is unavailable in the losing department). There should also be an appeal process for forgiveness of the debt where unforeseen circumstances warrant (for example, in the event of a medical retirement).

8. The DPA should work with the appropriate state agencies to negotiate and manage the subscription to a centralized, computer-based training (CBT) program for the core technologies employed by departments. The program should be available to approved state employee "students" via the Internet and must include student utilization and progression monitoring.

Computer-based training programs have proven to be a popular and effective preparation for, or supplement to, instructor-led training. However, many departments are independently contracting for the purchase of or subscription to CBT services. With a number of core technologies in common, economies-of-scale

savings should be realized through a central state subscription to computer-based training with access by participating departments through the Internet.

In keeping with the roles identified by the Governor's Training Action Team, it is recommended that DPA consult with the ITCC, an advisory body of Department CIOs, to define a CBT program for optimal use by departments. Since the Governor's Training Action Team recommended that the California State Library - California Research Bureau be the repository for other training information, it is recommended that the Bureau negotiate with vendors and manage a cost-effective CBT subscription. That service would be available to IT employees in accordance with their training plans upon referral by their managers. The subscription should include the ability for the supervisor / manager to monitor the progress of the student.

9. The DPA should establish and monitor conformance with statewide policy that IT managers attend continuing education to include, but not be limited to customer service, administrative management, people management, project management and management level technical training.

The Gartner Group found that one of the critical success factors in the retention of staff is a manager skilled in managing people, expectations, and resources. However, California state IT managers often sacrifice their own continuing education in order to provide much needed staff technical training. Therefore, an important part of revised IT state training strategy must include continuing management training.

Consistent with other recommendations in this document, the DPA should establish the minimum requirements for continuing education for IT management positions. These courses will be part of each manager's annual training plan and the successful completion of these courses will be one of the criteria used in the annual performance evaluation of the manager.

MARKETING STATE IT CAREERS

Research Findings

As discussed in other parts of this report, the existing civil service structure and rules, combined with a significant compensation gap, have made it very difficult to fill critical positions with qualified individuals. Adopting the recommendations contained in the other sections of this report will help to "level the playing field" in the State's competition in the marketplace for the scarce IT skills needed. If actions are taken to implement those other recommendations, the State will still face a significant marketing challenge.

"The State does a poor job of marketing information technology job opportunities. The current image of state employment hinders our ability to attract and retain qualified information technology professionals."

The image of state employees in the eyes of many in the public does not contribute to attracting the best candidates for available jobs. Limited promotion of information technology opportunities results in fewer candidates becoming aware of available jobs. The State needs to improve the image of the state workforce and increase promotional activities in order to increase both the quantity and quality of job applicants.

There Are Important Benefits to State IT Employment

While state IT employment will not satisfy every applicant's needs, there are significant advantages to working in IT for the State that should be marketed aggressively. Some examples are:

- State IT jobs are perceived to be generally more stable than comparable private sector jobs with less likelihood of layoff, restructuring or forced relocation.
- The State, unlike some private employers, offers dental and vision benefits and a retirement program.
- Some state IT jobs provide an opportunity to make a significant public service contribution which may be attractive to candidates. Many of the IT jobs serving the people of California are associated with exciting projects with interesting work.
- Many state IT employees have an opportunity to work with some of the most advanced, computer equipment and software available.
- Many state IT jobs are very intellectually challenging and some offer significant opportunities for professional development.
- There is generally a greater opportunity for job mobility within the State's IT community than afforded in even the largest private sector firms. Transfers between departments are very common and acceptable.
- Most state IT jobs are in Sacramento, which many believe to be more desirable than the larger cities and the "Silicon Valley."
- For most state IT employees, required travel is limited, which is often considered advantageous.

Learning From The Private Sector

Comprehensive literature and other resources are not available to hiring supervisors to explain the features and benefits of state IT employment to candidates. Hiring supervisors are ill prepared to sell the benefits of state employment to candidates from outside of state government. Opportunities to sell the advantages are lost because hiring supervisors do not have the knowledge and collateral material that would assist their recruitment efforts.

"The State should develop marketing materials to assist in selling the benefits of IT employment."

Most employers devote more resources to marketing themselves to potential employees than the State. Frequently, materials such as annual reports, customer promotional materials and magazine article reprints are used to help sell a candidate on a particular company. These kinds of materials are frequently not available to state supervisors faced with recruitment problems. The State should develop marketing materials to assist in selling the benefits of IT employment.

Many employers are using every means possible to recruit qualified employees. Many of these activities further the marketing interests of the employer. Recruitment agencies are frequently used to locate candidates with an appropriate skill match. The agents help to sell the advantages of the job opportunity available. These services often cost between 20 to 30 percent of the employee's first year's salary. A recommendation concerning the State's use of professional recruiters is discussed under the Selection section of this report. Employee referral bonuses are another common tool used to locate good candidates. Current employees are often in a good position to help market state IT employment. A recommendation concerning the State's use of referral bonuses is included in the Compensation section of this report.

Of particular interest to the Task Force, was the ability to attract college students and recent graduates to state employment. While some of the marketing materials will help in converting Student Assistants to permanent employees, attracting college graduates will require special attention. For that reason, recommendations concerning outreach to college students and graduates are contained in the Selection section of this report.

Marketing Efforts Will Benefit Current Employees Too

Although the focus of the State's marketing efforts will be the outside candidate, the ability to assist in addressing the retention problem should not be underestimated. Current employees would benefit from the greater visibility and recognition of the IT profession in state service. In addition, the materials that help explain the state system to potential employees will be equally important to our current employees who may not fully understand the state system.

Current State Environment

Individual state departments are primarily responsible for attracting candidates and for hiring the best ones to meet the business needs of the department. Their efforts are made more difficult by the perception candidates have of state

employment and the lack of coordinated collateral material to support the hiring process. While the SPB has made good progress at assisting in marketing state employment, additional improvement is needed along with specific focus on IT recruitment.

Marketing Materials and Strategies Vary

Due to the independent marketing efforts of each state department, the Task Force Survey attempted to collect information regarding the types of marketing materials / media departments were using to assist in IT recruitment. The following is a summary of the responses received:

- Written bulletins and postings on department web sites and the SPB's web site;
- Paid advertisements in local newspaper;
- Paid advertisements in trade publications (e.g., Capital Weekly);
- Attending job fairs;
- Participation in college career days;
- Development of brochures and flyers; and
- Posting listings on the State Online Vacancy Database (VPOS).

While the responses received indicate that individual departments are actively marketing IT job openings, the responses from each department varied widely. This inconsistency showed that some departments utilized brochures, while other departments only attended job fairs.

The SPB Has Made Good Progress In Leveraging The Use of The Internet

Over the last few years, the SPB has added features and information to their Internet site designed to aid candidates in finding employment with the State. The resources available are becoming extensive, although admittedly general, given the breadth of positions available in state service. Recognizing the power of the Internet as a tool to communicate with potential employees, the State should leverage the existing investment by customizing and grouping materials specifically for the recruitment of IT professionals. Also, improving the appearance and usability of the information will leave candidates with the impression that the State would be a good place to work.

Currently, the SPB's web site (www.spb.ca.gov) is receiving over 2 million hits a month. The State should capitalize on this exposure and actively market all state IT positions.

Problem Statement

The State does a poor job of marketing information technology job opportunities. The current image of state employment hinders our ability to attract and retain qualified information technology professionals.

Recommendations

1. The DOIT, working with the SPB, should be charged with the overall responsibility for state IT marketing activities, including improving the public image of state IT efforts through visibility and positive publicity.

The DOIT has made progress on improving the image of state IT activities. The "Technology Day" event held in the State Capitol for the benefit of legislators and the public was a great success and generated some positive publicity. Likewise, the renewed interest in national recognition, as evidenced by California's showing in the NASIRE awards, helps to improve our image. These efforts are important in explaining to the public and potential employees the good work that is being done and should be formalized through the budget process.

2. The SPB should be funded and charged with responsibility for developing materials to assist state departments in recruiting IT employees. This should include:

- **Attractive marketing materials to reshape the image of state IT employment in a more positive light.**
- **Simple brochures to explain the civil service system, the job classifications available, compensation and other benefits, career advancement opportunities and the advantages of having a state IT job.**
- **Consideration should be given to other communication mechanisms such as radio or television ads, video that can be delivered via the Internet, newspaper and trade journal advertising, etc.**

Professionally developed collateral materials will assist departments in recruiting the most qualified candidates for available jobs and will help to raise the self-esteem of current employees. An excellent example of a marketing brochure, designed to aid CalTrans in their recruitment efforts, is included in this report as *Appendix E: CalTrans Marketing Brochure*. Under this recommendation, the SPB should be charged with leveraging the individual efforts of departments for the good of the entire state IT community.

3. The SPB should create a special section on their Internet site designed exclusively to attract and assist IT candidates in obtaining state employment.

This section should explain the benefits of state IT employment. It should also provide information about the civil service system, including a step by step approach on how to enter state service. This would cover such subjects as the application process, examinations, and interviewing with the State. Terms of any probationary periods should be explained along with general management practices of the State.

4. The SPB should create a single, searchable index on their Internet site exclusively for the posting of IT job opportunities open to the public and provide a simple way for all state departments to post job vacancies through this service.

The Internet is fast becoming the information source of choice for time sensitive, technology-oriented information. It can reasonably be expected that the vast majority of candidates for the State's most critical IT jobs will have ready access to the Internet. This medium offers the quickest, most cost effective way to get the word out about state employment in general and IT job openings in particular.

ENDNOTES

1 *IS Organization Challenges: Staff Skills, Training and Retention*, K. Dec, R. Mack, Gartner Group, October 1, 1997.

2 "US Will Focus on Tech Jobs – 346,000 Computer-Related Positions Vacant Nationwide," *Charleston Daily Mail*, January 12, 1998.

3 "US Will Focus on Tech Jobs – 346,000 Computer-Related Positions Vacant Nationwide," *Charleston Daily Mail*, January 12, 1998.

4 *IS Organization Challenges: Staff Skills, Training and Retention*, K. Dec, R. Mack, Gartner Group, October 1, 1997.

5 *IS Organization Challenges: Staff Skills, Training and Retention*, K. Dec, R. Mack, Gartner Group, October 1, 1997.

6 State Controllers Office, State of California, Civil Service Attrition Statistics July 1994 - July 1998, Details Provided in Appendix C.

7 Economic Research Institute Data Compared Against State of California Data, Non-Weighted Comparison, Details Provided in Appendix B.

8 Economic Research Institute Data Compared Against State of California Data, Non-Weighted Comparison, Details Provided in Appendix B.

9 *IS Organization Challenges: Staff Skills, Training and Retention*, K. Dec, R. Mack, Gartner Group, October 1, 1997.

10 *Does an Insane IT Labor Market Demand Insane Measures?*, Diane Tunick Morello, Gartner Group, May 28, 1998.

11 "Better Paid & Shortchanged," By Claire Tristram, *Computerworld*, June 15, 1998.

12 "Retention getters the 25 companies that excel at IT retention," By Alan R. Earls, *Computerworld*, 1998. "How to Attract and Retain Qualified IT Staff, By Wayne Hanson, Editor, *Government Technology*, May 1998. *Does an Insane IT Labor Market Demand Insane Measures?,* Diane Tunick Morello, Gartner Group, May 28, 1998.

13 *Does an Insane IT Labor Market Demand Insane Measures?*, Diane Tunick Morello, Gartner Group, May 28, 1998.

14 *Attacking the Help Desk Employee Retention Problem*, Diane Tunick Morello, Gartner Group, May 4, 1998.

15 "Task Force Survey of Other State's IT Compensation Practices," Internet Survey Conducted By the Department of Industrial Relations, September 1998.

16 *Does an Insane IT Labor Market Demand Insane Measures?*, Diane Tunick Morello, Gartner Group, May 28, 1998.

17 "IT Retention and Recruitment: A Status Report," Gene Raphaelian, Gartner Group, Government Technology Conference, May 1998.

18 *Transition Dilemma: Retaining IT Professionals*, D. Tunick, Gartner Group, October 28, 1997.

19 "Task Force Survey of Other State's IT Compensation Practices," Internet Survey Conducted By the Department of Industrial Relations, September 1998.

20 "Playing for Keeps", A. Frankel, *CIO Magazine*, January 1, 1998.

21 "Task Force Survey of Other State's IT Compensation Practices," Internet Survey Conducted By the Department of Industrial Relations, September 1998.

22 *IS Organization Challenges: Staff Skills, Training and Retention*, K. Dec, R. Mack, Gartner Group, October 1, 1997.

23 "Task Force Survey of Other State's IT Compensation Practices," Internet Survey Conducted By the Department of Industrial Relations, September 1998.

24 "Retention getters the 25 companies that excel at IT retention," By Alan R. Earls, *Computerworld*, 1998.

[25] Memo to Dan Sumpter from Joan Abate, Gartner Group, dated August 3, 1998

[26] Memo to Dan Sumpter from Joan Abate, Gartner Group, dated August 3, 1998

[27] *Attacking the Help Desk Employee Retention Problem*, Diane Tunick Morello, Gartner Group, May 4, 1998.

[28] State of Nebraska, "Information Technology Employee Recruitment and Retention", February 1998

[29] State of Ohio, "Civil Service Employees Association Collective Bargaining Agreement, March 1997-February 2000."

[30] "Task Force Survey of Other State's IT Compensation Practices," Internet Survey Conducted By the Department of Industrial Relations, September 1998.

[31] "Task Force Survey of Other State's IT Compensation Practices," Internet Survey Conducted By the Department of Industrial Relations, September 1998.

[32] State Controllers Office, State of California, Civil Service Attrition Statistics July 1994 - July 1998, Details Provided in Appendix C.

[33] State Controllers Data, SPB Report 5112: *Intake and Promotions of All Employees By Department Occupational Group and Occupation*, SPB Report 1205: *Turnover of Civil Service Employees All Time Basis by Occupational Schematic Group.*

[34] *IS Organization Challenges: Staff Skills, Training and Retention*, K. Dec, R. Mack, Gartner Group, October 1, 1997.

[35] Department of Personnel Administration data source, Bureau of Labor Statistics, Consumer Price Index, not seasonally adjusted. These U.S. city averages have been used in recent California collective bargaining negotiations.

[36] Department of Personnel Administration data includes eight large counties; five large cities; University of California; California State University; and Federal.

[37] State Personnel Board, "Hearing on Information Technology Issues", July 1, 1998

[38] Calculation based on State Controller Data, August 28, 1998. Detail calculation by classification is noted in Appendix D.

[39] "US Will Focus on Tech Jobs – 346,000 Computer-Related Positions Vacant Nationwide," *Charleston Daily Mail*, January 12, 1998.

[40] "US Will Focus on Tech Jobs – 346,000 Computer-Related Positions Vacant Nationwide," *Charleston Daily Mail*, January 12, 1998.

[41] *IS Organization Challenges: Staff Skills, Training and Retention*, K. Dec, R. Mack, Gartner Group, October 1, 1997.

[42] "Internet Recruiting Shows Rapid Growth," By Alice Starcke, Human Resources Magazine, August 1996.

[43] "Online Population Estimates Differ," By Patrick Thibodeau, Computerworld, June 29, 1998.

[44] "US Will Focus on Tech Jobs – 346,000 Computer-Related Positions Vacant Nationwide," *Charleston Daily Mail*, January 12, 1998.

[45] "Retention getters the 25 companies that excel at IT retention," By Alan R. Earls, *Computerworld*, 1998.

[46] *Report to Governor*, State of Texas Department of Information Resources.

[47] "Task Force Survey of Other State's IT Compensation Practices," Internet Survey Conducted By the Department of Industrial Relations, September 1998.

[48] "Retention getters the 25 companies that excel at IT retention," By Alan R. Earls, *Computerworld*, 1998.

[49] "Retention getters the 25 companies that excel at IT retention," By Alan R. Earls, *Computerworld*, 1998.

[50] *IS Organization Challenges: Staff Skills, Training and Retention*, K. Dec, R. Mack, Gartner Group, October 1, 1997.

[51] *IS Organization Challenges: Staff Skills, Training and Retention*, K. Dec, R. Mack, Gartner Group, October 1, 1997.

[52] Larry Geisel, Knowledge Universe, former CIO of Netscape, citing Stanford Research Institute report, August 1998.

[53] "Retention Deficit Lessons, by Alan R. Earls, *Computerworld*, February 9, 1998, Retention Deficit Lessons, Alan R. Earls

[54] "Retention getters the 25 companies that excel at IT retention," By Alan R. Earls, *Computerworld*, 1998.

[55] Results of August 1998 survey of 26 State of California Departments representing 3,100 IT positions.

[56] "US Will Focus on Tech Jobs – 346,000 Computer-Related Positions Vacant Nationwide," *Charleston Daily Mail*, January 12, 1998.

[57] "US Will Focus on Tech Jobs – 346,000 Computer-Related Positions Vacant Nationwide," *Charleston Daily Mail*, January 12, 1998.

[58] *IS Organization Challenges: Staff Skills, Training and Retention*, K. Dec, R. Mack, Gartner Group, October 1, 1997.

[59] "Annual Training Survey, Personal trainers," By Fawn Fitter, *Computerworld*, March 30, 1998.

[60] *The Dollars and Sense of IT Professional Training*, J. Weller, K. Potter, B. Stewart, Gartner Group, January 20, 1998.

[61] State of Kansas, "IT Premium Pay Guidelines", November 1997.

[62] State of Ohio, "Civil Service Employees Association Collective Bargaining Agreement, March 1997-February 2000."

[63] *Staffing for the Year 2000: Challenges Abound*, Weller, M. Hotle, D. Tunick, B. McNee, Gartner Group, October 1, 1997.

[64] Established by Governor's Executive Order W-151-97.

[65] Senate Bill 1: December 5, 1994, Article 2, Section 11713